The technological process for the preparation of ET and Logika elements (Fig. 1) consists of soldering the circuit components on a getinaks foil board (1) with printed circuitry terminating on one side in pin leads (2) for wiring or plug-in connection. The plate with the circuitry in a special carbolite housing (4) is placed perpendicular to the base backing (3), and the unit is filled with an epoxy compound (5) for protection against ambient media.

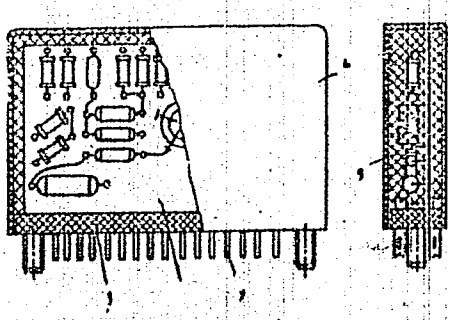


Fig. 1

2/4

Deficiencies of the production technology of the ET and Logika elements are their large size, inefficient utilization of space by purchased semiconductor parts, technologically unjustified use of the printed circuit board and of a large quantity of auxiliary parts, and the inefficient arrangement of the semiconductor elements on the board.

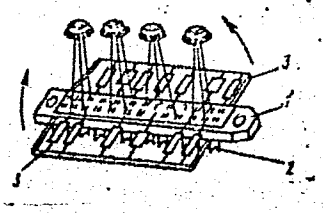


Fig. 2

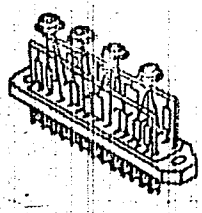


Fig. 3

These deficiencies were eliminated through the use of a new technological method of construction and manufacture of the element. Thus, if board 1 with leads 2 (fig. 2) is assembled and the component parts are located in two special circuit subassemblies 3, and a row of parts (usually transistors) are located vertically directly on the leads of the base board; it is then possible to have a good solid solder joint by connecting the two circuit subassemblies. After the assembly has been completed, the two outward subassemblies [3] are rotated around the horizontal axis to a vertical position for maximum utilization of space. The element is then sent to quality control for wiring inspection. It is then considered ready for potting (Fig. 3).

The use of the new manufacturing technology for semiconductor logic and functional elements made it possible to produce the device of half the size of the previous one while at the same time consolidating the circuitry and shortening the length of wiring and reducing the labor input in the manufacture of the element (by 33-50%).

4/4

USSR

UDC: 531.787.3

KUDASHEV, Ye. B., VEREB'YEVSKIY, I. D.

"A Method of Graduating Converters of Turbulent Pressure Pulsations"

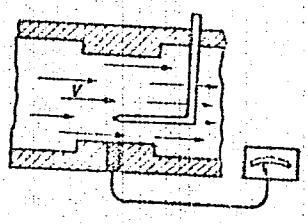
Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329427, Division G, filed 16 Feb 70, published 9 Feb 72, p 166

Translation: This Author's Certificate introduces a method of graduating converters of turbulent pressure pulsations by placing a reference converter and the converter to be graduated at the same distance from a point of the pressure field, measuring the voltages of the reference converter and the converter to be graduated on a predetermined frequency, and calculating the sensitivity of the converter to be graduated. As a distinguishing feature of the patent, precision is improved by placing the reference converter and the converter to be graduated alternately in the same position on a surface in a streamline flow, producing a turbulent flow of identical velocity, determining the spectral density of the pressure pulsations with the reference converter, and graduating the other converter by determining its sensitivity from the ratio of its electric signal to the spectral density of the pressure pulsations throughout the range of working frequencies.

1/2

USSR

KUDASHEV, Ye. B., VEREB'YEVSKIY, I. D., USSR Author's Certificate No 329127



2/2

1/2 017 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--THE DEVELOPMENT OF MICROSPORIDIANS OF INSECTS IN THE ENTOMOPATHOGENIC NEMATODE NEOAPLECTANA AGRIOTOS, NEMATODA:

AUTHOR-(02)-VEREMCHUK, G.V., ISSI, I.V.

COUNTRY OF INFO--USSR

SOURCE--PARAZITOLOGIYA 4(1): 3-7. ILLUS. 1970

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--NEMATODA, INSECTA, MICROSCOPY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0417 STEP NO--UR/9057/70/004/001/0003/0007

CIRC ACCESSION NO--AP0134185

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134185

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A POSSIBILITY OF THE MICROSPORIDIAN SPORE TRANSMISSION BY THE ENTOMOPATHOGENIC NEMATODES, NEOAPLECTANA AGRIOTOS, FROM DISEASED CATERPILLARS OF THE CABBAGE WHITE BUTTERFLY, PIERIS BRASSICAE L. INFECTED IN ADVANCE WITH NOSEMA MESNILI (PALILLOT), AND FROM DISEASED CATERPILLARS OF THE CUT WORM AGROTIS SEGETUM SCHIFF. INFECTED WITH PLISTOPHORA SCHUBERGI ZW., TO HEALTHY CATERPILLARS OF THE SAME INSECT SPECIES WAS INVESTIGATED. MICROSCOPIC ANALYSIS OF THE NEMATODES DEVELOPED IN DISEASED INSECTS INDICATED THAT THEY WERE INFECTED WITH MICROSPORIDIA OF THEIR OWN HOSTS.

FACILITY: ALL-UNION INST. PLANT PROT., LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC: 539.3/5:678

UMANSKIY, E. S., KRYUCHKOV, V. V., VEREMCHUK, S. S., Kiev

"Creep and Recovery of Composite Films at High Temperatures"

Kiev, Problemy Prochnosti, No 7, Jul 72, pp 111-115.

Abstract: Results are presented from a study of the creep and recovery of six types of magnetic media based on lavsan under isothermal conditions at temperatures of 20, 40, 60 and 80° C. The instantaneous viscoelastic and residual deformation was studied as a function of temperature, load and time. A linear integral hereditary equation with a kernel in the form of the diffractional-exponent function of Yu. M. Rabotnov is used to describe the creep curves of the class of materials studied. Calculation values of creep deformation are produced at working stress levels which coincide with the experimental results with accuracy sufficient for practice.

1/1

1/2 037 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--MECHANICAL PROPERTIES OF POLY,VINYL CHLORIDE, FILMS DURING BIAXIAL EXTENSION -U-

AUTHOR-(02)-VEREMCHUK, S.S., UMANSKIY, E.S.

COUNTRY OF INFO--USSR

SOURCE--PROBL. PROCH. 1970, (3), 51-4

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--POLYVINYL CHLORIDE, PLASTIC FILM, PHTHALATE, PLASTICIZER, TENSILE STRENGTH, LOW TEMPERATURE EFFECT, MATERIAL DEFORMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0798 STEP NO--UR/3663/70/000/003/0051/0054

CIRC ACCESSION NO--AP0136232

UNCLASSIFIED

2/2 037 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136232

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. POLY(VINYL CHLORIDE) FILMS PLASTICIZED WITH DIOCTYL PHTHALATE WERE STRETCHED IN 2 PERPENDICULAR DIRECTIONS SIMULTANEOUSLY. THE RATIO OF THE APPLIED STRESSES (SIGMA SUBY-SIGMA SUBZ) WAS VARIED FROM 0 TO INFINITY. DECREASE OF THE TEMP. FROM 0 TO MINUS 40DEGREES INCREASED THE TENSILE STRENGTH AT BREAK (TAKEN AS SIGMA SUBY OR SIGMA SUBZ, WHICHEVER THE GREATER) OF THE FILMS. FROM MINUS 40DEGREES (GLASS POINT) TO MINUS 60DEGREES THERE WAS LITTLE CHNAGE. GRAPHS SHOW SIGMA SUBY OR SIBMA SUBZ VS. DEFORMATION AND SIGMA SUBY VS. SIGMA SUBZ IN THE MINUS 60 TO 0DEGREES RANGE. FACILITY: KIEV. POLITEKH. INST., KIEV, USSR.

UNCLASSIFIED

USSR

UDC 534.21:539.3

LUKASHEV, A.A., LYSKO, YE.M., VEREMEYENKO, S.V., VOZHEVSKAYA, S.M., LOSHCHININ, V.F. (Kishinev), All-Union Scientific Research Institute for the Development of Non-Destructive Methods and Facilities for Quality Control of Materials.

"Distribution of Elastic Waves in a Solid For a Four-Constant Elastic Model of a Continuous Medium"

Kiev, Prikladnaya Mekhanika, No 3, 1972, pp 32-35

Abstract: Equations are obtained for the velocity of sound in a nonlinear four-constant model of a continuous elastic medium. Change of the velocities of the longitudinal waves with pressure is described by a combination of second- and third-order elastic constants. Change of the velocities of the transverse waves is determined only by second-order elastic constants (geometrical nonlinearity). It is shown that the numerical values of second-order elastic constants obtained at zero pressure and at uniaxial compression differ by a factor of several units. 1 table, 4 bibliographic entries.

1/1

VERENICH, G. I.

UDC: 614.1:313.13-053.5(476-25)

MORBIDITY AMONG RURAL SCHOOL CHILDREN OF POLES'YE

[Article by G. I. Verenich, Candidate of Medical Sciences, Scientific Research Institute of Mother and Child Care, Belorussian Ministry of Health, Minsk, Moscow, Sovetskoye Zdravookhraneniye, Russian, No 11, 1972, submitted 21 July 1972, pp 12-14]

A study was made of physical development of Polesye school children during the 1965-1966 school year. At the same time morbidity among pupils of nine rural secondary schools in eight rayons of Brestskaya and Gomel'skaya oblasts of Belorussian SSR (Stolinskiy, Berezovskiy, Kamenetskiy, Malorita-skiy, Ivatsevichskiy, Narovlyanskiy, Naryzskiy, Ivanovskiy) in 1967 was analyzed.

Information about all cases of illness among the school children in statistical cards of special sentinel cards from outpatient charts, district hospitals, and records of house calls. Data pertaining to infectious morbidity were verified at the SED [Sanitary and Epidemiological Department] of rayon hospitals. In addition to information about number of patient visits we also used the results of comprehensive physical examinations. Only diagnoses made by physicians were taken into consideration.

The morbidity rate among children and adolescents of Polesye (per 1,000 counting diseases of the mouth and teeth) constitutes 819.2 per 1,000 surveyed; for boys the morbidity rate is 804.3 and for girls 834.1 (see Table).

We observed a rise in this index in girls during the years of puberty. At 10-13 years of age, the morbidity rate constituted 979 per 1,000, which is 140 cases of illness more than the overall morbidity rate for 7-12-year-old girls. Apparently these shifts are attributable to increased reactivity of the organism in connection with significant functional and morphological changes during puberty.

In boys a higher morbidity rate was observed during the first few school years. Thus, in 7-12-year-old boys morbidity constituted 925.5 per 1,000 and at the age of 14-17 years it was 649.4, i.e. 260.1 cases less.

USRS 57875
2 Jan 75

USSR

UDC 666.76:621.792

VERENKOVA, E. M., TROFIMOV, M. G., FROLOV, A. S., and DIKAYA, I. I., All-Union Scientific Research Institute of Aircraft Materials

"Properties of Ceramic Coatings From Phosphate Ceramics"

Moscow, Ogneupory, No 1, Jan 71, pp 41-45

Abstract: Working on the assumption that the introduction of phosphate compounds into the composition of refractory oxides permits an increase in the adhesion strength of ceramic coatings and their thermal stability, the authors studied Al_2O_3 and ZrO_2 powder compositions with additions of aluminum phosphate binder with the following composition: 10-11 percent H_3PO_4, 15-16 percent $Al(H_2PO_4)_3$, 23-24 percent $Al_2(HPO_4)_3$, 50-51 percent H_2O. Density of binder 1.55-1.64 g/cm^3. Weight ratio $Al_2O_3:P_2O_5$ in the binder was 1:3.8. The coatings were applied by rod gas-flame

1/2

USSR

VERENKOVA, E. M., et al., Ogneupory, No 1, Jan 71, pp 41-45

spraying. The resultant phosphate ceramic coatings possess good adhesion to metals and alloys, thermal stability, and impact strength. These properties are 1.5-3 times greater than those of existing aluminum oxide and zirconium dioxide coatings with or without additions of sodium silicate. On the basis of their low thermal conductivity and high adhesion strength and thermal stability, the coatings are recommended for the protection of metals and alloys against the effects of high-temperature gas flows.

2/2

USSR

UDC: 621.396.96:621.391.837.1

VERENTSOV, B. A., KRASYUK, N. P., TUPITSYN, L. A., SHAPERIN, I. I.

"Defining Characteristics for Radar Recognition of Objects"

Tr. Sev.-Zap. zaoch. politekhn. in-t (Works of the Northwest Polytechnical Correspondence Institute), 1972, No 20, pp 5-8 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12G8 [résumé])

Translation: The authors examine selection of optimum parameters of a radar signal reflected from a target, where these parameters are typical characteristics of an observed class of objects. It is shown that there is an optimum duration for the probe signal which depends on the structure of the object. Data are given from corresponding experiments.

1/1

1/2 009 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--ACCESSORY DEVICE FOR A SPECTROGRAPH FOR DETERMINING TRACE AMOUNTS OF MERCURY -U-

AUTHOR-(02)-VERES, G.I., PERFILYEV, A.P.

COUNTRY OF INFO--USSR

SOURCE--ZAVOD. LAB. 1970, 36(2), 248-9

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--MERCURY, TRACE ANALYSIS, METAL VAPOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1884 STEP NO--UR/0032/70/036/002/0248/0249

CIRC ACCESSION NO--AP0118846

UNCLASSIFIED

2/2 009 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0118846

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HG AT 10 PRIME NEGATIVE7-10 PRIME NEGATIVE8PERCENT CAN BE DETD. IF A REGULAR FLOW OF HG VAPORS INTO THE ARC ZONE (ARC CURRENT 8 A) IS SECURED. A 10-G SAMPLE IS PLACED IN A HORIZONTAL QUARTZ TUBE 10-15 MM IN DIAM., ONE END OF WHICH IS CONNECTED WITH AN AIR SOURCE AND THE 2ND ONE, TAPERED INTO A 3 MM CAPILLARY, TO THE ELECTRODE. A 50-MM LONG FURNACE, HEATED TO 800DEGREES, MOVES ALONG THE 150-MM SAMPLE LENGTH DURING THE TIME OF EXPOSURE, WHICH IS 9 MIN.

FACILITY: VSES. ZAOCH. POLITEKH. INST., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 622:621.395/.396(022).004

BIZIN, P. S., VERESCHAGIN, G. P., ROL'NIK, M. A.

"Mine Communication and Signaling"

Shakhtnaya svyaz' i signalizatsiya (cf. English above), Moscow, "Nedra," 1970, 166 pp, ill. 1 r, 23 kop (from RZh--Elektrosvyaz', No 6, June 1970, Abstract No 6.64.50K)

Translation: The distinctive features are considered of the explosiveproof use of apparatus for mine communication. The organizational principles and new systems of dispatcher and general mine communication are given, and also the means of communication and signaling which assure operative direction of production processes with respect to the mining and transportation of coal. Communication systems at the period of construction of shafts [shakhta] are described and also the communication means during mine rescue operations. Methods of adjustment and operational maintenance for new communication are presented. Standard design solutions are presented for the arrangement in mines of the apparatus under consideration. The book is intended for specialists occupied with the planning, installation, and operation of apparatus for mining communication and signaling; it may also be useful to students of mining institutes and tekhnikums. 109 ill. 14 tab. 40 ref. Summary.

1/1

1/2 027 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--A NEW TYPE OF DISPERSION FILTERS FOR THE INFRARED SPECTRAL REGION -U-

AUTHOR-(02)-BORISEVICH, N.A., VERESCHAGIN, V.G.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL. 12, JAN. 1970, P 168-172

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--IR FILTER, IR SPECTRUM, CRYSTAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1979/1611 STEP NO--UR/0368/70/012/000/0168/0172

CIRC ACCESSION NO--AP0047933

UNCLASSIFIED

2/2 027 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0047933

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DESCRIPTION OF DISPERSION FILTERS FOR IR LIGHT WHICH ARE PREPARED BY COMPRESSION OF TWO DIFFERENT POWDERED CRYSTALS INTO SINGLE COMPACTS AND ARE FOUND TO BE, MORE VIBRATION STABLE THAN CRYSTAL AIR AND CRYSTAL LIQUID FILTERS USED HERETOFORE. A TOTAL OF 45 BINARY SYSTEMS OF CRYSTALLINE MATERIALS WITH PASSBANDS AT 4 TO 25 MU ARE STUDIED. OPTIMAL PREPARATION PROCEDURES FOR THESE FILTERS ARE OUTLINED AND THE TEMPERATURE DEPENDENCE OF THEIR PASSBANDS IS INVESTIGATED, SHOWING THEIR STABILITY AT TEMPERATURES FROM MINUS 50 TO PLUS 50DEGREESC. MIXED CRYSTALS OF THE ALKALI HALIDE SERIES WHOSE REFRACTIVE INDICES CAN BE SMOOTHLY VARIED WITHIN A WIDE RANGE OF VALUES ARE SUGGESTED AS PREFERRED MATERIALS FOR THESE FILTERS.

USSR

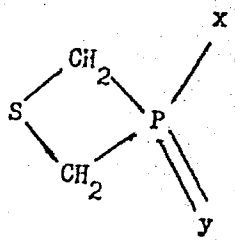
UDC 541.63:547.1'118

ARBUZOV, B. A., ARSHINOVA, R. P., VERESHCHAGIN, A. M., and VUL'FSON, S. G., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzova, Academy of Sciences, USSR, Chemical Institute imeni A. M. Butlerov, Kazakstan State University imeni V. I. Ul'yanova-Lenina

"Steric Configurations Containing Phosphorus Heterocyclics. 3. Gauche Conformation of the Alkoxy Group in 3-Alkoxy-1-thia-3-phosphethanes"

Moscow, Seriya Khimicheskaya, 9, 1973, pp 1964-1967

Abstract: A four-membered ring containing two heteroatoms -- one of S and one of P -- of the type below for the given sets of x and y was examined:



(I) x = OMe, y = O
(II) x = OPh, y = O
(III) x = OMe, y = S
(IV) x = OPh, y = S
(V) x = OC_6H_4-p-NO_2, y = S

1/2

USSR

ARBUZOV, B. A., et al., Seriya Khimicheskaya, 9, 1973, pp 1964-1967

The molecules can have either a bent or a flat configuration. The dipole moments and Kerr constants were determined for all five compounds and shown both as graphs and in tables. On the basis of these graphs it was shown that these compounds occur in the bent configuration and have angles of less than 140 to 165°. The phosphoryl or thiophosphoryl group occupies a pseudoequatorial position while the methoxy and phenoxy groups have a gauche orientation.

2/2

USSR

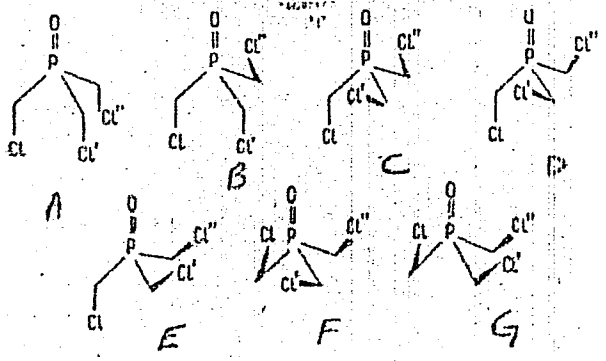
UDC 541.6:541.127.4:547.1'118

RAYEVSKIY, O. A., VERESHCHAGIN, A. N., KHALITOV, F. G., and DONSKAYA, YU. A., Institute for Organic and Physical Chemistry imeni A. YE. Arbuzov, Academy of Sciences USSR

"Analysis of Conformational Equilibrium of Tris(chloromethyl)-phosphine Oxide"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 3, 1972, pp 710-712

Abstract: The following conformations are possible:



USSR

RAYEVSKIY, O. A., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 3, 1972, pp 710-712

The IR spectra, dipole moments (D.M.) and Kerr constants (K.C.) can provide information on the conformational equilibrium and the actual forms present. The D. M., in μ , and K.C., in K X 10^{12}, values for the above forms from thermodynamic calculations are as follows: A, 1.19 and 45; B, 2.23 and 58; C, 416 and 63; D, 4.12 and 38; E, 5.07 and 375; F, 6.07 and -528; and F, 6.59 and -206. The measured values are 2.34 and -55, indicating a mixture of conformers. The forms C, D, and E may be eliminated due to their D.M. and K.C. values. The probable equilibria are A $\rightleftharpoons$ B and F $\rightleftharpoons$ G. The equilibria A,B $\rightleftharpoons$ F,G are unlikely on the basis not only of the closest fit to experimental and calculated parameters but also of theoretical calculations. Form F, in which all the C-Cl bonds are directed toward one side has the least steric hindrance. The considerable influence of the electrostatic interaction in indicated in that A is the most stable form. In A, the P = O and C - Cl dipoles are oriented antiparallel.

2/2

USSR

UDC 541.6;547.1'118

RAYEVSKIY, O. A., VERESHCHAGIN, A. N., and KHALITOV, F. G., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR

"Conformations of Trimethylphosphate and Trimethylthiophosphate"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, Feb 72, pp 353-358

Abstract: There are 16 possible conformations of trimethylphosphate, six of which can be excluded from equilibrium considerations due to steric hinderance. To determine the predominant conformation among the remaining ones, the IR spectra and dipole moments of trimethylphosphate and the Kerr constants of trimethylthiophosphate were determined. The isomeric composition was determined on the basis of the integral band intensities of $\nu_{P=O}$ (1250-1350 cm^{-1}) and $\nu_{P=S}$ (570-670 cm^{-1}) in relationship to the temperature and the dielectric constant of the medium. The band at 1180 cm^{-1} (for trimethylphosphate) and at 2840 cm^{-1} (for trimethylthiophosphate) were used for comparative purposes. The conformational composition under various conditions was determined. The most stable conformation is the one with cis-orientation of one and gosh-orientation of two alkoxy groups in relationship to (thio)-phosphoryl group; one of the forms in which the alkoxy group is in the trans-position is in equilibrium with the predominant conformer. 1/1

USSR

UDC 541.67:547.879

VERESHCHAGIN, A. N., ARSHINOVA, R. P., VUL'FSON, S. G., CHERKASOV, R. A., and OVCHINNIKOV, V. V., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, USSR Academy of Sciences, at Kazan', and Kazan' State University imeni V. I. Ul'yanov-Lenin

"Steric Structure of Phosphorus-Containing Heterocycles. II. Dipole Moments and Kerr Constants of Certain 2-Thiono-1,3,2-Dioxaphosphorinanes"

Riga, Khimiya Geterotsiklicheskikh Soyedineniy, No 11, Nov 71, pp 1464-1468

Abstract: Continuing their earlier research on the steric structure of this group of heterocycles, the authors studied four of the 2-thiono-1,3,2-dioxaphosphorinanes with use of the dipole-moment and Kerr-effect methods, along with nuclear magnetic resonance (P^{31}) data. The steric interactions in these four compounds, the Kerr constants of possible structures of compound IV, and the dipole moments of the four, were all determined experimentally. The 2,4-dimethyl- and 2-chloro-2-thiono-1,3,2-dicxaphosphorinanes have chair configuration with the equatorial thionophosphoryl group; the 2-methyl derivative exists in the form of an equilibrium mixture of the axial and equatorial conformers, with predominance ofthe former.

1/1

USSR

UDC 547.1'118'112

ARBUZOV, B. A., VIZEL', A. O., VERESHCHAGIN, A. N., RAYEVESKIY, O. A., and ZVEREVA, M. A., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR

"1-Halogen-1-thioxophospholenes"

Mosoow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 11, Nov 71, pp 2489-2493

Abstract: For the purpose of synthesizing isomeric 1-halogen-1-thioxophospholenes and studying some of their properties, the authors isolated three pairs of isomers containing chlorine and bromine at the phosphorus atom. The chlorides were obtained by the interaction of the corresponding isomers of 1-chloro-1-oxophospholene with P_2S_5, bromides by the interaction of the diene adduct of phosphorus tribromide with H_2S. A mixture of isomers with a preponderance of 3-phospholene was formed in this case. All the products were considered pure when further distillations failed to change physiochemical characteristics and their IR spectra contained no signs of isomeric products. IR and Raman spectra were taken of the oxygen- and sulfur-containing derivatives of 2-phospholene and 3-phospholene and their dipole moments determined.

1/1

1/2 026 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--SYNTHESIS AND STUDY OF THE ANISOTROPY OF POLARIZABILITY AND DIPOLE MOMENTS OF SOME COMPOUNDS OF THE ENDOXOCYCLOHEXANE SERIES -U-

AUTHOR-(04)-VERESHCHAGIN, A.N., GROZINA, L.A., KHAMATULLINA, I.M., ARBUZOV, B.A.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (4), 792-7

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ANISOTROPY, DIPOLE MOMENT, ORGANIC SYNTHESIS, CYCLOHEXANE, FURAN, OXIDATION, PHTHALIC ACID, EPOXY COMPOUND, DIELECTRIC PROPERTY, NITRILE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1003 STEP NO--UR/0062/70/000/004/0792/0797

CIRC ACCESSION NO--AP0134715

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0134715

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONVENTIONALLY PREPD. DIELS ALDER ADDUCTS OF FURAN WERE OXIDIZED WITH HCO SUB2 H,H SUB2 O TO TRANS,1,2,DICYANO,4,5,EPOXY,3,6,ENDOXOCYCLOHEXANE, M. 124-6DEGREES, AND THE CIS ISOMER, M. 123-4DEGREES, WHOSE DIPOLE MOMENTS, FROM DIELEC. DATA, WERE, RESP., 2.92 AND 5.62 D. THE FOLLOWING DIPOLE MOMENTS AND KERR CONSTS. (M PRIMEKX1012), RESP., WERE REPORTED: 3,6 ENDOXD,DELTA PRIME4,TETRAHYDROPHTHALIC ANHYDRIDE, 5.53, NEGATIVE 99.6; TRANS,1,2,DICYANO,3,6,ENDOXO,4,CYCLOHEXENE, 3.18, 65.8; CIS ISOMER, 5.55, 468.7; TRANS,1,3,DICYANO,4,5,EPOXY,3,6,ENDOXOCYCLOHEXANE, 2.92, NEGATIVE 31.8; CIS ISOMER, 5.62, 404.2; AND 4,5,EPOXY,3,6,ENDOXOHEXA,HYDROPHTHALIC ACID, 4.03 NEGATIVE. OXIDN. OF DIELS ALDER ADDUCTS OF FURAN WITH DINITRILES YIELDS EXO EPOXY DERIVS.

FACILITY: KAZAN. GOS. UNIV. IM. UL'YANOVA-LENINA, KAZAN, USSR.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--NATURE OF THE THIRD MAXIMUM IN ANGULAR DISTRIBUTIONS OF ELASTICALLY SCATTERED DEUTERONS -U-

AUTHOR-(04)-VERESHCHAGIN, A.N., TERENETSKIY, K.O., CHERNOV, I.P., TUKAREVSKIY, V.V.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(2), 460-3

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--DEUTERON SCATTERING, ELASTIC SCATTERING, ANGULAR DISTRIBUTION, SCATTERING CROSS SECTION, CALCIUM ISOTOPE, TITANIUM ISOTOPE, MANGANESE ISOTOPE, SPIN ORBIT COUPLING, NUCLEAR MODEL, DIFFERENTIAL CROSS SECTION, CYCLOTRON/(U)U120 CYCLOTRON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0205 STEP NO--UR/0048/70/034/002/0460/0463

CIRC ACCESSION NO--AP0105281

UNCLASSIFIED

2/2 018 UNCLASSIFIED

CIRC ACCESSION NO--AP0105281 PROCESSING DATE--16OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A STRONGLY RELATIVISTIC OPTICAL POTENTIAL AND A POSSIBILITY OF OBTAINING FURTHER EXPTL. DATA ALLOWED FOR A STUDY OF FORMING THE 3RD MAX. THAT REPRESENTS AN ANOMALY IN THE ANGULAR DISTRIBUTION OF CROSS SECTIONS OF THE ELASTIC SCATTERING OF 13.6 MEV D ON NUCLEI WITH A APPROXIMATELY EQUAL TO 50. IN THE U-120 CYCLOTRON, THE ELASTIC SCATTERING OF THESE D WAS STUDIED ON PRIME40 CA, PRIME46-50 TI, AND PRIME55 MN NUCLEI. SCATTERED D WERE REGISTERED WITH TELESCOPES CONSISTING OF SI(LI) DETECTORS FORMED BY THIN (DE-DX) AND THICK (E) SPECTROMETERS OF THICKNESSES 150 AND 1500 MM, RESP. THE SELECTION OF D WAS BASED UPON THE (DE-DX)E LAW. GEOMETRIC CONDITIONS OF THE EXPT., MONITORING THE FLUX AND EXPRESSING THE ABS. VALUES WERE DESCRIBED BY V. V. ALEXEEV, ET AL. (1968). ERRORS OF ABS. VALUES FOR DIFFERENTIAL CROSS SECTIONS DID NOT EXCEED PLUS OR MINUS 10PERCENT. THE CALCN. OF DIFFERENTIAL CROSS SECTIONS WAS BASED UPON THE OPTICAL MODEL OF THE NUCLEUS, TAKING SPIN ORBITAL INTERACTION INTO ACCOUNT. INTRODUCING THE SPIN ORBITAL INTERACTIONS INTO THE OPTICAL MODEL OF THE NUCLEUS YIELDS A RELIABLE ELUCIDATION OF EXPTL. RESULTS IN THE 3RD MAX. REGION. FACILITY: INST. FIZ., KIEV, USSR.

UNCLASSIFIED

USSR

Nuclear Physics

VERESHCHAGIN, A. N., TERENETSKIY, K. O., CHERNOV, I. P. and TOKAREVSKIY, V. V., Institute of Physics of the Academy of Sciences UkrSSR, Kiev State University imeni T. G. Shevchenko

"On the Nature of the 'Third Maximum' in Angular Distributions of Elastically Scattered Deuterons"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol. 34, No. 2, Feb 70, PP 460-463

Abstract: Anomalies in angular distributions observed in studying differential cross sections for the elastic scattering of 13.6 Mev deuterons over a wide range of atomic weights are discussed, particularly the anomalous behavior of the so-called "third maximum" in the neighborhood of nuclei with $A \approx 50$: while the remaining maxima of the angular distributions are shifted towards smaller angles as A increases, the position of the third maximum for Ti^{48}, $Cr^{50,52,54}$ and Fe^{56} shifts towards greater angles as A increases. The third maximum for nuclei with $A > 56$ merges with the fourth and is not detectable experimentally. In this article, new experimental data and a more realistic optical potential is used to find an explanation for this anomaly. The elastic scattering of 13.6 Mev deuterons by Ca, Ti, and Mn nuclei was measured on the U-120

USSR

VERESHCHAGIN, A. N., et al, Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, Vol. 34, No. 2, Feb 70, pp 460-463

of the Scientific Research Institute of Nuclear Physics at Tomsk Polytechnical Institute. The optimal potential parameters were calculated for the different isotopes using both theoretical and experimental cross sections. It was found that the experimental data in the region of the third maximum are satisfactorily explained by taking into account spin-orbital interaction.

USSR

UDC 541.5:547.1'118

RAYEVSKIY, O. A., KHALITOV, F. G., VERSCHCHAGIN, A. N., VETLUZHSKIKH, I. M., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov of the USSR Academy of Sciences

"Conformational Analysis of Some Compounds Containing the $P(O)CH_2Cl$ Group"

Moscow, Izvestiya Akademii Nauk SSR -- Seriya Khimicheskaya, No 11, 1972, pp 2446-2450

Abstract: A study was made of six compounds containing the PCH_2Cl group: the dichloroanhydride of chloromethylphosphonic acid (I), dimethyl (chloromethyl) phosphine oxide (II), the methyl(chloromethyl)phosphonic acid chloride (III), diphenyl(chloromethyl)phosphine oxide (IV), phenyl(chloromethyl)phosphonic acid chloride (V) and phenylmethyl(chloromethyl)phosphine oxide (VI)

$$R^1R^2P(O)CH_2Cl$$

$R^1 = R^2 = Cl$ (I); $R^1 = R^2 = CH_3$ (II); $R^1 = Cl$, $R^2 = CH_3$ (III); $R^1 = R^2 = C_6H_5$ (IV); $R^1 = C_6H_5$, $R^2 = Cl$ (V); $R^1 = C_6H_5$, $R^2 = CH_3$ (VI)

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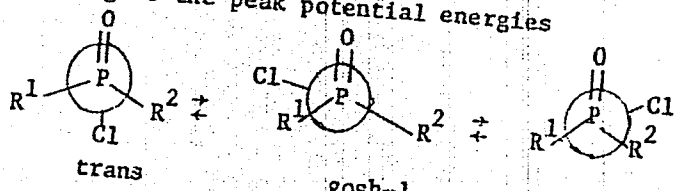
USSR

RAYEVSKIY, O. A., et al., Izvestiya Akademii Nauk SSR -- Seriya Khimicheskaya, No 11, 1972, pp 2446-2450

On rotation around the P-C bond three positions of the C-Cl bond are possible corresponding to the peak potential energies



trans gosh-1 gosh-2

The infrared spectral data, the dipole moments and the Kerr constant were used to investigate the spatial structure of the compounds containing the $P(O)CH_2Cl$ group. Equilibrium of the goshand trans-conformers the position of which depends on the nature of the substitutions on the phosphorus atom is characteristic of all the investigated compounds in solution. The factors causing the energy stability of the conformers were evaluated quantitatively. In the absence of bulky substitutions the electrostatic interactions play the defining role. The frequency of the valence escillations of the phosphoryl group depends on the spatial orientation of the irregular group.

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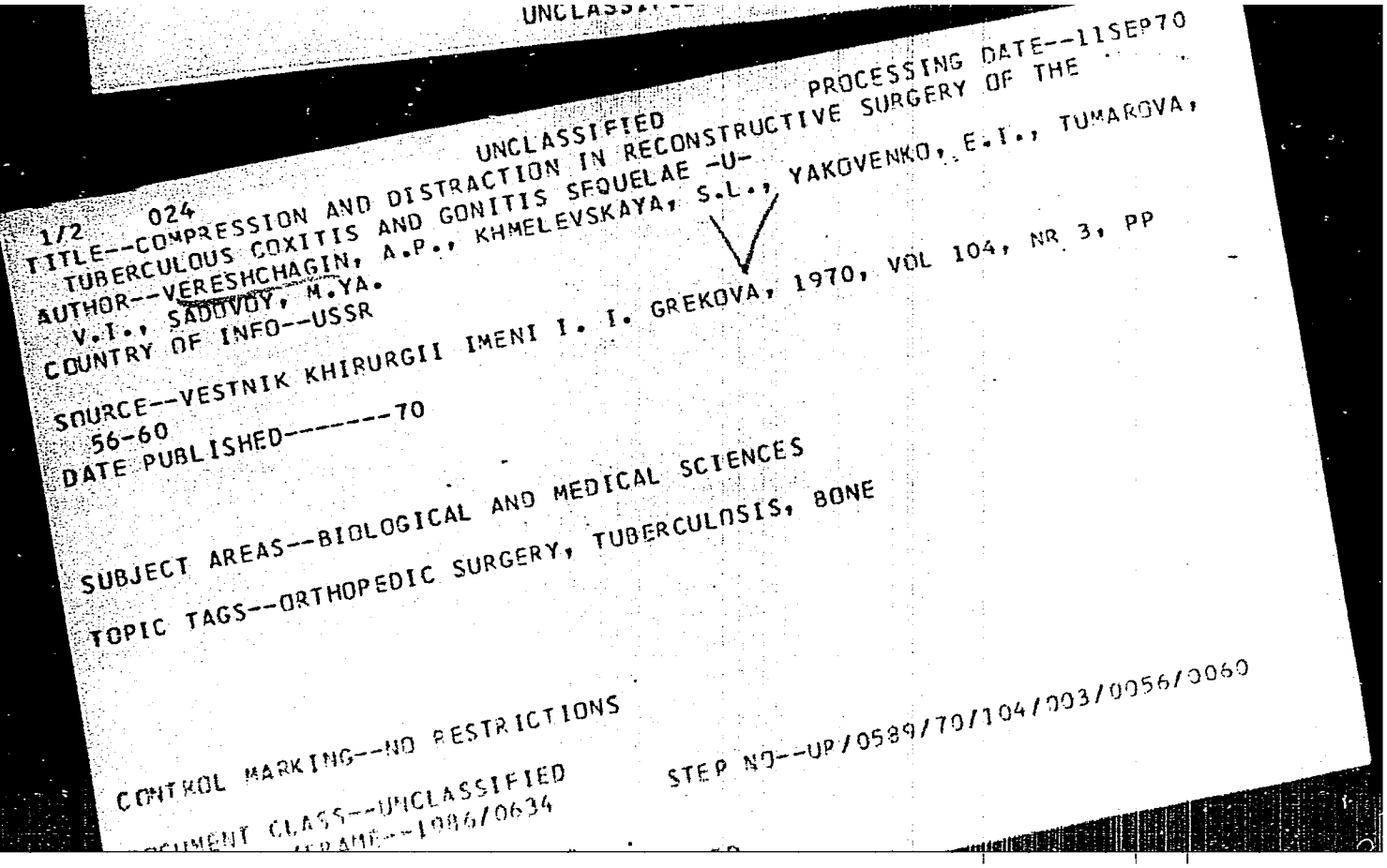


UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--COMPRESSION AND DISTRACTION IN RECONSTRUCTIVE SURGERY OF THE TUBERCULOUS COXITIS AND GONITIS SEQUELAE -U-

AUTHOR--VERESHCHAGIN, A.P., KHMELEVSKAYA, S.L., YAKOVENKO, E.I., TUMAROVA, V.I., SADOVOY, M.YA.

COUNTRY OF INFO--USSR

SOURCE--VESTNIK KHIRURGII IMENI I. I. GREKOVA, 1970, VOL 104, NR 3, PP 56-60

DATE PUBLISHED-------70

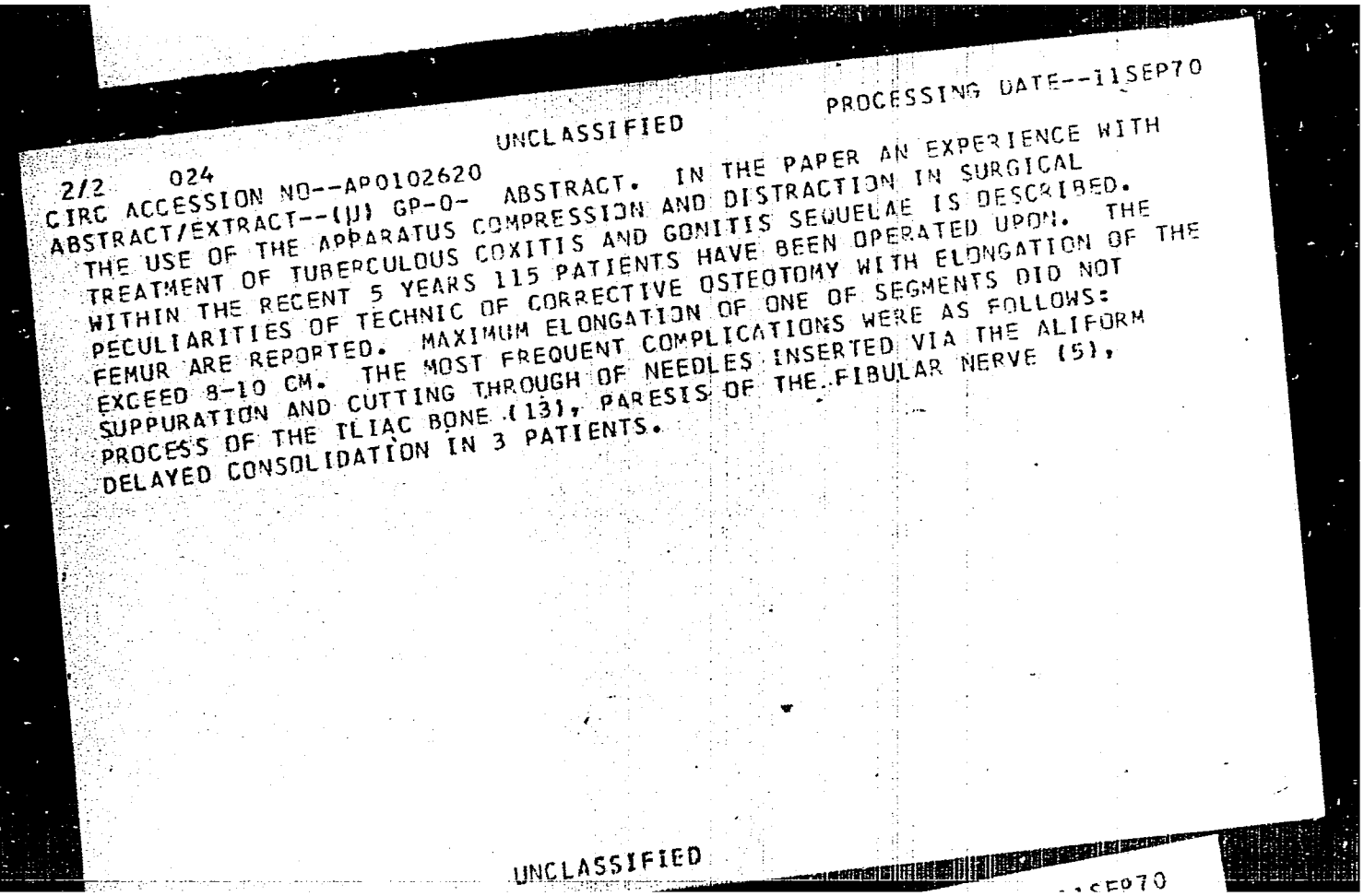
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ORTHOPEDIC SURGERY, TUBERCULOSIS, BONE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED STEP NO--UR/0589/70/104/003/0056/0060

FRAME--1996/0634



UNCLASSIFIED PROCESSING DATE--11SEP70

2/2 024

CIRC ACCESSION NO--AP0102620

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN THE PAPER AN EXPERIENCE WITH THE USE OF THE APPARATUS COMPRESSION AND DISTRACTION IN SURGICAL TREATMENT OF TUBERCULOUS COXITIS AND GONITIS SEQUELAE IS DESCRIBED. WITHIN THE RECENT 5 YEARS 115 PATIENTS HAVE BEEN OPERATED UPON. THE PECULIARITIES OF TECHNIC OF CORRECTIVE OSTEOTOMY WITH ELONGATION OF THE FEMUR ARE REPORTED. MAXIMUM ELONGATION OF ONE OF SEGMENTS DID NOT EXCEED 8-10 CM. THE MOST FREQUENT COMPLICATIONS WERE AS FOLLOWS: SUPPURATION AND CUTTING THROUGH OF NEEDLES INSERTED VIA THE ALIFORM PROCESS OF THE ILIAC BONE (13), PARESIS OF THE FIBULAR NERVE (5), DELAYED CONSOLIDATION IN 3 PATIENTS.

UNCLASSIFIED

--SEP70

UDC: 533.652/.661.013

USSR

VERESHCHAGIN, I. F., MALANIN, V. V., PESTRENIN, V. M.

"Optimizing the Time of Flight of an Aircraft With Controllable Radial Thrust"

Uch. zap. Perm. un-t (Scientific Notes of Perm' University), 1971, No 239, pp 130-139 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7B341)

Translation: The authors consider motion of an aircraft in a central field of gravity with controllable radial force, the control function being limited with respect to absolute value to some fixed constant. The principle of the maximum is used to solve the problem of speed-optimum motion of the aircraft. Selected as phase coordinates are: the inverse of the radius vector of the vehicle and its derivative with respect to the polar angle. Two examples are presented, one of which is transition from an outer to an inner orbit. In this example, motion first takes place with maximum attraction, and then with maximum repulsion. G. S. Aronin.

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UDC: 533.652/.661.013

USSR

VERESHCHAGIN, I. F., MALANIN, V. V., SHLYAPIN, Ya. K.

"Motion of an Aircraft With Nozzle in a Cardan Suspension"

Uch. zap. Perm. un-t (Scientific Notes of Perm' University), 1971, No 239, pp 104-129 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7B340)

Translation: On the basis of previously derived equations of motion (see abstract 7B339), an investigation is made of the motion of an aircraft with nozzle in a Cardan suspension. In integration of the linearized equations of rotational motions, programmed rotation of the vehicle relative to the longitudinal axis is predetermined. The conditions of stability of this motion are considered in the absence of rotations relative to the other axes and when the nozzle is in the neutral position. Damping of the angular velocity is also considered in two modifications, as well as reduction of the rotation of the vehicle to a single axis and stabilization of the position of the vertical hull of the vehicle. The equations of motion of the center of mass are integrated for one special case -- horizontal flight with regard to atmospheric drag. G. S. Aronin.

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UDC: 533.652/.661.013

USSR

VERESHCHAGIN, I. F., POPOVA, M. I., SEMENOV, S. G.

"Some Cases of Motion of an Aircraft With a Complete Internal Program"

Uch. zap. Perm. un-t (Scientific Notes of Perm' University), 1971, No 239, pp 171-181 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7B342)

Translation: An aircraft is considered as a system of several connected bodies, one of which is a platform. It is assumed that the laws of motion for all these bodies relative to the platform are known. Some special cases are considered: 1) the system consists of a shell within which a sphere rotates at a constant angular velocity, the ellipsoid of inertia of the system being a sphere; 2) the vehicle is a solid of revolution within which a sphere rotates. For the given cases, integrals are derived which define the motion of the vehicle about the center of mass. G. S. Aronin.

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UDC: 533.652/.661.013

USSR

BOROVIK, V. N., VERESHCHAGIN, I. F., YAKOVLEV, V. I.

"Game Situations on a Sphere"

Uch. zap. Perm. un-t (Scientific Notes of Perm' University), 1971, No 239, pp 49-61 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7B338)

Translation: The authors consider game situations of pursuit on a sphere of constant radius when a pursuing vehicle strives to approach the pursued vehicle in the minimum time after detection. The process of the game is limited by the fuel supply, atmosphere is disregarded, both vehicles operate in the limit mode. Optimum trajectories and maneuvers are found for approach of the vehicles in a given time, and a solution is found for the problem where the pay-off is time of motion of the vehicles. Solution of the principal equation of differential games shows that the thrust vectors in the case of optimum control should be parallel to each other (in the same direction in the case of an opposing target, and in opposite directions in the case of a cooperating target), the direction of these vectors depending on the relative range of the vehicles at the end of the game. The optimum trajectories of both vehicles are arcs of a great circle. G. S. Aronin.

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UDC: 533.652/.661.013

USSR

VERESHCHAGIN, I. F., MALANIN, V. V., SHLYAPIN, Ya. K.

"Equations of Motion of an Aircraft With Nozzle in a Cardan Suspension"

Uch. zap. Perm. un-t (Scientific Notes of Perm' University), 1971, No 239, pp 85-103 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7B339)

Translation: Equations of motion (rotational motion and displacement of the center of mass) are derived for an aircraft consisting of two parts -- a rigid hull within which a solid fuel charge is located, and a nozzle held in a Cardan suspension with two degrees of freedom relative to the hull. Effects due to displacement of the center of mass and the geometric characteristics of the vehicle are taken into consideration. After derivation of the complete system of equations, simplifications are made for the case where the center of mass of the nozzle coincides with the center of suspension, and the hull is axisymmetric, and the equations are also linearized. The equations of motion of the center of mass are considered in localized, velocity, and absolute systems of coordinates. It is recommended that the velocity system be used in the presence of aerodynamic forces, and that the others be used in the absence of such forces. G. S. Aronin.

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UDC 533.652/.661.013

USSR

VERESHCHAGIN, I. F., SEMENOV, S. G.

"Investigation of the Perturbed Motion of a Liquid-Fuel Jet Aircraft"

V sb. Konf. po kolebaniyam mekh. sistem. Tezisy dokl. (Conference on Oscillations of Mechanical Systems. Abstracts of the Reports), Kiev, "Nauk. dumka", 1971, p 18 (from RZh-Mekhanika, No 10, Oct 71, Abstract No 10B242)

Translation: The authors consider the motion of an aircraft which has a cylindrical fuel tank in which the liquid level varies. The vehicle undergoes small oscillations close to the programmed motion. The stability of vertical flight is analyzed. An optimum regulator is synthesized.

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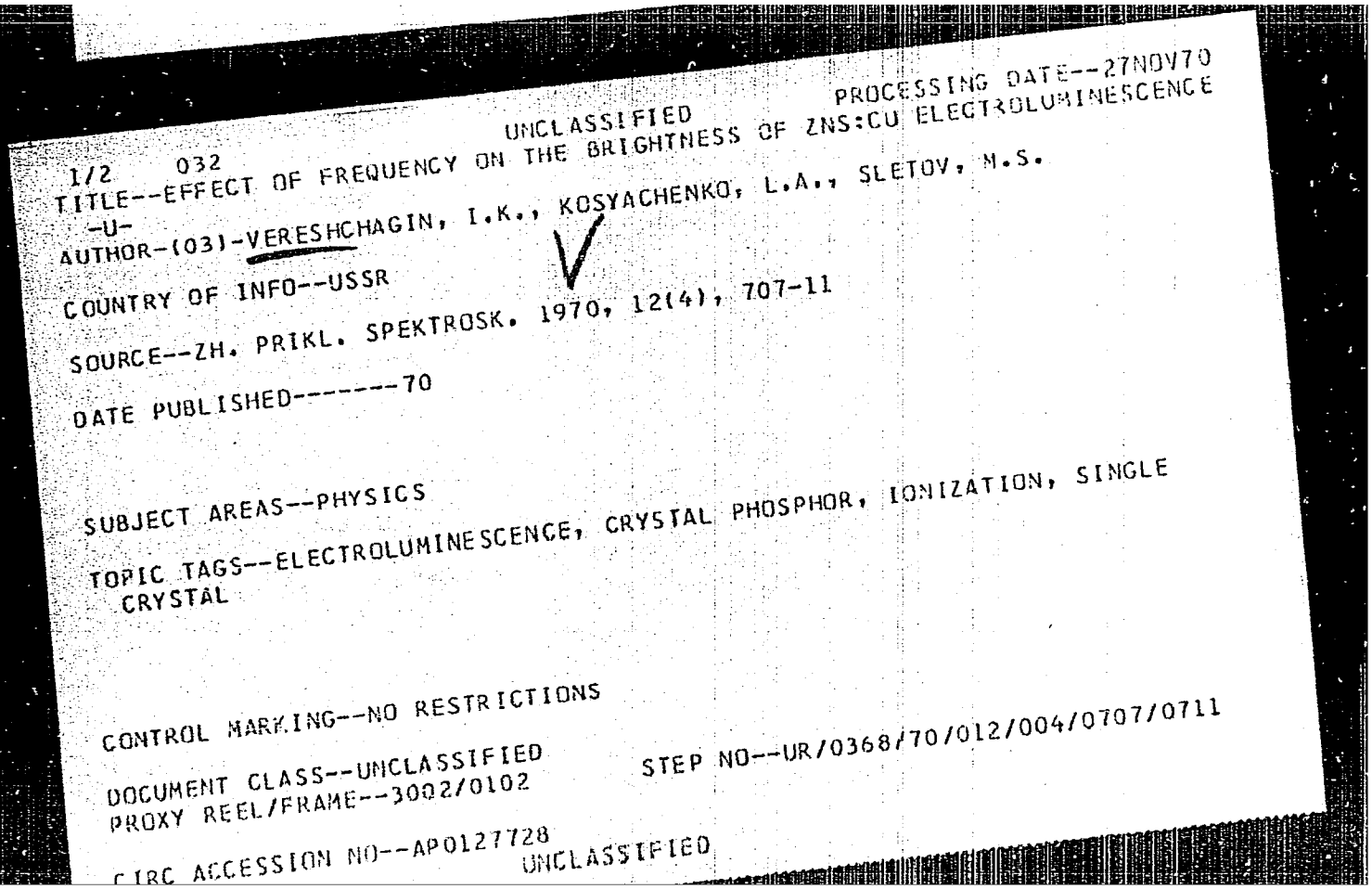

1/2 032 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--EFFECT OF FREQUENCY ON THE BRIGHTNESS OF ZNS:CU ELECTROLUMINESCENCE -U-

AUTHOR-(03)-VERESHCHAGIN, I.K., KOSYACHENKO, L.A., SLETOV, M.S.

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. SPEKTROSK. 1970, 12(4), 707-11

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTROLUMINESCENCE, CRYSTAL PHOSPHOR, IONIZATION, SINGLE CRYSTAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED STEP NO--UR/0368/70/012/004/0707/0711

PROXY REEL/FRAME--3002/0102

CIRC ACCESSION NO--AP0127728 UNCLASSIFIED

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UNCLASSIFIED PROCESSING DATE--27NOV70

2/2 032

CIRC ACCESSION NO--AP0127728

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FREQUENCY (SINUSOIDAL VOLTAGE) DEPENDENCE OF THE BRIGHTNESS OF ELECTROLUMINESCENCE B(F) OF ZNS:CU PHOSPHORS OF THE EL 510 AND EL 460 TYPE WAS STUDIED BY OBTAINING B (F) CURVES AT ROOM TEMP., SIMILAR TO 0-16 KHZ, AND 5.6-34 V FOR CONDENSERS CONSISTING OF POLYCRYST. ZNS CU LAYERS (OF VARIOUS THICKNESS AND AREAS) COMPRESSED BETWEEN 2 PLATES OF VARIOUS DIELECS. (GLASS, EPOXY RESIN, METALS) AND FOR CELLS WITH ZNS:CU SINGLE CRYSTALS. THE OBSD. MAX. ON THE B(F) CURVES SHIFT TOWARD HIGHER FREQUENCIES WITH INCREASING VOLTAGE. THE FORM OF THE B(F) CURVES IS DETD. MAINLY BY THE PROPERTIES OF THE PHOSPHOR, BUT THE EFFECTS OF THE NATURE OF THE DIELEC AND THE CELL STRUCTURE HAVE TO BE TAKEN INTO ACCOUNT. TO EXPLAIN THE FREQUENCY DEPENDENCE OF THE BRIGHTNESS OF THE ELECTROLUMINESCENCE OF ZNS:CU PHOSPHORS, THE RATE OF IONIZATION AND THE LIGHT SUM WERE MEASURED AS A FUNCTION OF THE PULSE DURATION OF THE EXCITATION VOLTAGE. THE FREQUENCY DEPENDENCE OF THE BRIGHTNESS MAY BE EXPLAINED BY TAKING INTO ACCOUNT THE TIME DEPENDENCE OF THE IONIZATION PROCESSES AND THE CAPACITANCE PROPERTIES OF THE BARRIER AREAS.

UNCLASSIFIED

UDC 621.359.7.001.5

USSR

BURAYEV, T. K., and VERESHCHAGIN, I. P., Moscow

"Physical Processes Involved In the Atomization of Liquids in an Electric Field"

Moscow, Energetika i Transport, No 5, Sep-Oct 71, pp 70—79

Abstract : The atomization process of a liquid from the capillary in an electric field was experimentally investigated. From droplet photographs obtained by light pulse, characteristics of droplet deformation on the capillary end were examined. Calculations and experiments revealed that the stability loss of the droplet surface in location of its maximum curvature and the throw-out of a thin small jet are required conditions for a fine-dispersed atomization in the electric field. From a derived equation the value of the relation b/a of an assumed ellipsoidal droplet (a and b are the semi-axes of the ellipsoid) at which the stability loss occurs can be determined for initial values of b and the uniform field intensity by absence of the semi-ellipsoid. Limiting values were determined of the surface tension coefficient of conducting liquids above which the atomization is impossible because of developing corona discharge on the surface of the liquid. Five illustr., four tables, 21 formulas, ten biblio. refs.

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UDC: 684.333

USSR

VERESHCHAGIN, L. A., Institute of Automation

"A Device for Modeling Displacement of Matter in a Moving Medium"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 46, Dec 73, Author's Certificate No 407347, Division G, filed 13 Apr 72, published 21 Nov 73, p 167

Translation: This Author's Certificate introduces a device for modeling displacement of matter in a moving medium. The device contains a velocity pickup and a running load pickup which are connected to the input of a multiplier. The unit also incorporates a registration module, displays, a pulse generator, and a power supply. As a distinguishing feature of the patent, speed is increased by adding a frequency converter connected to the multiplier output, a serial register connected to the frequency converter, an adding converter made in the form of series-connected switches with resistors in parallel. The resistors are connected to the power supply. Also added is a frequency divider connected by the input to the pulse generator. The outputs of the frequency divider are connected to the inputs of the serial register, and the outputs of the serial register

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USSR

VERESHCHAGIN, L. A., USSR Author's Certificate No 407347

are connected to the controlling inputs of the switches in the adding converter, which is connected to the registration module and to the inputs of the displays which are made in accordance with the pneumatic scheme of the moving medium.

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USSR

SHANDITSEV, V. A., VERESHCHAGIN, L. F., YAKOVLEV, YE. N., GRAZHDANKINA, N. P., and ALAYEVA, T. I., Institute of High-Pressure Physics, Academy of Sciences USSR, Akademgorodok, Moscow Oblast

"Electron Magnetic Resonance Study of Chromium Telluride at Pressures up to 50 Kbar"

Leningrad, Fizika Tverdogo Tela, Vol 15, Vyp 1, Jan 73, pp 212-215

Abstract: The electron magnetic resonance method ($\lambda \approx 3.2$ cm) was used to study the magnetic transition in chromium telluride at pressures up to 50 kbar and temperatures of 100-360° K. It was found that the linear variation of the Curie point with pressure continues up to 25 kbar. At pressures from 30±4 and up to 50 kbar, the resonance line characteristic of the ferromagnetic phase of CrTe is not observed in the 100-300° K temperature range. The disappearance of the resonance line of the ferromagnetic phase may be due to the appearance of antiferromagnetic ordering at pressures above 30 kbar in chromium telluride, although the antiferromagnetic resonance line cannot be observed in this frequency region.

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USSR

KASATOCHKIN, S. V., ALAYEVA, T. I., YAKOVLEV, YE. N., and VERESHCHAGIN, L. F., Institute of High-Pressure Physics, Academy of Sciences USSR, Akademgorodok, Moscow Oblast

"Pressure Change of Cubic Splitting Parameter in EPR Spectrum of Gd^{3+} Ion in Fluorite-Type Crystals"

Leningrad, Fizika Tverdogo Tela, Vol 15, vyp 1, Jan 73, pp 312-313

Abstract: The authors studied the effect of hydrostatic pressure (up to 10 kbar) on the spin hamiltonian parameters of the Gd^{3+} ions in fluorite-type crystals. CaF_2, SrF_2, and BaF_2 doped with Gd^{3+} ions (0.1 at. percent) were studied. It was found that the parameter b_4 varies according to the law

$$b_4 \simeq a^n,$$

where $n \simeq 7$. Previous experiments on the variation of the Gd^{3+} ion EPR spectrum with temperature in fluorite-type crystals (T. REVAY) give the value $n \simeq 15$.

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USSR

KASATOCHKIN, S. V., et al., Fizika Tverdogo Tela, Vol 15, vyp 1, Jan 73, pp 312-313

Thus, there are great differences in the variation law for the parameter b_4, depending on the way in which the change in the lattice parameter is realized.

The authors thank S. A. AL'TSHULER and B. Z. MALKIN for discussing the results of the work, L. D. LIVANOVA and M. S. ORLOV for providing quality samples, and YU. A. TIMOFEYEV for frequent advice and assistance in the work.

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Dec 72

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(2)

Fateyeva, N. S., and L. F. Vereshchagin. Melting curve of molybdenum up to 90 kbar. ZhETF P, v. 14, no. 4, 1971, 233-235.

A test is briefly described in which the melting curve of pure Mo under high pressure was measured by an optical method described earlier by the authors. The method is based on simultaneous determination of the radiation intensity ratios I_1/I_2 and I_2/I_3 of two pairs of narrow spectral regions, and their subsequent comparison with Planck's law. The experimental T(P) plots of Fig. 1 can be presented by the linear equation

$$T_M = 2883 + 0{,}8 \cdot 10^{-3} P \qquad (1)$$

where T is melting point in °K and P is the pressure in bars. The probable error is ±% for both T and P measurements. A similar experiment was reported by Fatayeva et al on melting characteristics of graphite under high pressure [Explosion Effects Report No. 2, p. 58].

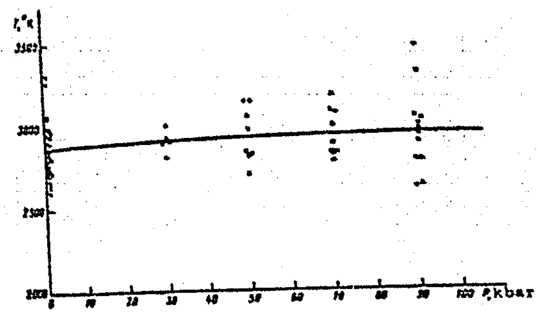

Fig. 1. Melting curve of Mo up to 90 kbar, calculated from all experimental points.
+ - temperature data of I_1/I_2 measurements,
x - temperature data of I_2/I_3 measurements.

VERESHCHAGIN, L. F.

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510012-5"

UDC: 53.07/.08+53.001.5

USSR

POLYAKOV, Ye. V., VERESHCHAGIN, L. F., KONYAYEV, Yu. S., Editorial Staff of the Journal "Pribory i Tekhnika Eksperimenta"

"Entropy Diagram and Indicator Chart for a 16 000-Bar Hydraulic Compressor"

Teplovaya i indikatornaya diagrammy gidravlicheskogo kompressora na 16 000 bar. AN SSSR (cf. English above. Academy of Sciences of the USSR), Moscow, 1971, 21 pp, ill., bibliography of 10 titles, No 3612-71 Dep. (from RZh-Fizika, No 4, Apr 72, Abstract No 4A132 DEP)

Translation: A study is made of entropy diagrams and indicator charts for a 16 000-bar hydraulic compressor. The curves were plotted by means of specially developed temperature and pressure pickups. The resultant graphs are used as a basis for drawing conclusions on the polytropism of processes of compression and expansion, the degree of perfection of the seals, and the effect of the clearance and nature of operation of the delivery valve on the productivity of a hydraulic compressor. Authors' abstract.

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UDC 546.3-19

USSR

SHTERENBERG, L. YE., SIESAREV, V. N., and VERESHCHAGIN, L. F., Institute of Physics of High Pressures, Acad. Sc. USSR, Moscow

"The Influence of Alloying Elements on the Quantity of Diamonds Synthesized in Presence of Metal Catalysts"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 46, No 6, Jun 72, pp 1476-1478

Abstract: The reasons behind the influence of alloying elements on the quantity of diamonds synthesized in the system metal-carbon were studied. It was found that in a three compartment system Fe + C + X a 5% addition of X (Al, Si, Mg, and Ni) gave higher yields of the diamonds. Cr and Mn failed to increase this yield. In the range of 3-5% sulfur increased the yield, but when 9% sulfur was added -- the yield dropped. Addition of $CaSi_2$ to nickel lowered the yield of diamonds, but addition of S to Ni_3C had no inhibitory effect. It is claimed that the thermodynamic factors determine the effect of alloying metals on the production of diamonds.

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USSR

LITYAGINA, L. M., KABALKINA, S. S., and VERESHCHAGIN, L. F., Institute of High-Pressure Physics, Academy of Sciences USSR

"Conditions for Formation and Existence of MnF_2 Phase With α-PbO_2 Structure"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 62, No 2, Feb 72, pp 669-672

Abstract: For purposes of studying conditions for the appearance and existence of an α-PbO_2 phase, a detailed study was made of the crystal structure of MnF_2 with an initial rutile-like structure during isothermal pressure reduction from 70 kbars to atmospheric pressure at 400, 300, and 25° C. A high-pressure X-ray camera with external heating was used, making it possible to obtain powder diagrams. NaCl was added to the investigated MnF_2 samples. The following phase transitions were observed: distorted fluorite $\rightarrow$ fluorite $\rightarrow \alpha$-PbO_2 at 300 and 400° C, distorted fluorite $\rightarrow \alpha$-PbO_2 at 25° C.

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USSR

LITYAGINA, L. M., et al., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 62, No 2, Feb 72, pp 669-672

To study the possibility of transformation from α-PbO_2 to a fluorite structure, the α-PbO_2 phase obtained by reducing pressure was subjected to the reapplication of high pressure in the same sample. The results indicate transitions in reverse: viz., α-PbO_2 $\rightarrow$ fluorite $\rightarrow$ distorted fluorite at 300 and 400° C, α-PbO_2 $\rightarrow$ distorted fluorite at 25° C. The appearance and existence of the α-PbO_2 phase under these conditions are due to the action of shear stresses which occur in the sample on removal of the load or on reloading.

2/2

USSR

UDC 620.1+621.9.038

VERESHCHAGIN, L. F., Academician, SEMERCHAN, A. A., MODENOV, V. P., BOCHAROVA, T. T., DMITRIYEV, M. YE., Institute of High-Pressure Physics of the Academy of Sciences USSR, Moscow

"Synthetic Diamond -- A Material for High-Pressure Chambers of the Order of a Megabar"

Moscow, Doklady Akademii Nauk SSSR, Vol. 195, No. 3, 21 Nov 70, pp 593-594

Abstract: The problem of obtaining pressures of 1 megabar and above in high-pressure chambers can be solved, in the opinion of the authors, by using composition materials based on synthetic microcrystalline diamonds. It is noted that pressures that can be achieved in high-pressure equipment depend not only on the construction of the equipment but also primarily on the physicomechanical properties of materials used to make the essential parts of the equipment. Tungsten carbide is known to become so plastic after reaching a pressure, in the central part of the equipment of the order of 400 kbar that a further increase in load does not lead to an appreciable rise in pressure inside the chamber. The example given for the reason for interest in achieving pressures of the order of several megabars is the theoretical calculations

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VERESHCHAGIN, L. F., et al, Doklady Akademii Nauk SSSR, Vol. 195, No. 3, 21 Nov 70, pp 593-594

of Schneider [Helv. Phys. Acta, 42. Fasc. 7/8, 957(1969)] who showed that it is possible to obtain metallic hydrogen at a pressure of the order of 2 megabars which probably has the properties of a superconductor with a high critical temperature. Samples of the materials were produced in a high pressure and temperature device of large capacity. Pressure was necessary in this case not only to reduce the graphitization of the diamond grain under heating but also to produce a sufficiently dense diamond-containing briquet. A metallographic study of the structure showed a predominance of diamond crystals, while the binding was the smaller portion of the volume of the material. The diamond grains have multiple contacts and apparently form a three-dimensional framework, as distinct from existing abrasive compositions in which diamond crystals are isolated from one another by the binder. The hardness of samples with a grain size of 2-3 μ was on the average 97 HRA. The elastic modulus as determined by an ultrasonic method on samples of size 12 × 8 mm with a grain size of 10-15 μ was ~60,000 kG/mm^2. It is concluded that exceptional hardness exceeding the hardness of known metallo- and mineral-ceramic solid alloys, in combination with a sufficiently high elastic modulus-can be obtained in diamond compositions with a high concentration of diamond and a minimum concentration of binder made by the application of high pressures.

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USSR

UDC 539.89

FATEYEVA, N. S., VERESHCHAGIN, L. F., Academician

"Tantalum Melting Curve up to 60 Kilobars"

Moscow, Doklady Akademii Nauk SSSR, Vol 197, No 5, 1971, pp 1060-1061

Abstract: A study was made of the melting curve of tantalum -- one of the most refractory metals. Experiments using tantalum containing a few tenths of a percent of niobium are described briefly. The melting point was determined in accordance with Planck's law by studying the sample, beginning with the intensity ratio for two narrow spectral intervals

$$I_1(\lambda_1)/I_2(\lambda_2) = f(T).$$

In comparing the intensity ratios I_1/I_2 and I_2/I_3 obtained experimentally, with the intensity ratios on the calculated calibration curve for the melting point of tantalum at atmospheric pressure (3,268 $\pm$ 50°K) taken as the initial point for the measurements in the described experiments, a correction was introduced for selective absorption of the radiation by the vapor of the investigated substance surrounding the sample during heating.

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FATEYEVA, N. S., et al., Doklady Akademii Nauk SSSR, Vol 197, No 5, 1971, pp 1060-1061

The measurement results are plotted on a graph from which it is obvious that the melting point of tantalum increases with pressure, reaching 3,567°K at 60 kilobars. The experimental data can be represented by a linear equation

$$T_{melt} = 3{,}249 + 5.3 \cdot 10^{-3} P:$$

where T_{melt} is the melting point in °K, and P is the pressure in bars.

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UDC 535.337

USSR

PANFILOV, V. V., SUBBOTIN, S. I., and VERESHCHAGIN, L. F., Academician of the Academy of Sciences, USSR, Institute of High-Pressure Physics, Academy of Sciences USSR

"Shifting of the Fundamental Absorption Edge of Gallium Arsenide Under the Action of Hydrostatic Pressure"

Moscow, Doklady Akademii Nauk SSSR, Vol 196, No 3, 1971, pp 559-561

Abstract: Investigation of the shift of the fundamental absorption edge of semiconductors with pressure permits determination of the change of the width of the forbidden zone with pressure, and makes it possible to ascertain some features of the zonal structure of the substances; in particular, this investigation is useful for identification of the symmetry of the very lowest conductivity zones. Gallium arsenide GaAs was taken as the object of investigation. The present article deals with a new attempt to measure the value of the pressure coefficient for gallium arsenide in a broader range of hydrostatic pressures than has previously been done by other researchers. Two figures, 12 bibliographic entries.

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UDC 539.89

USSR

KABALKINA, S. S., SHCHERBAKOV, M. O., VERESHCHAGIN, L. F., Academician, Institute of High Pressure Physics of the Academy of Sciences USSR

"On the Question of Polymorphous Transformation in AgCl at High Pressure"

Moscow, Doklady Akademii Nauk SSSR, Vol. 193, No. 5, 11 Aug 70, pp 1015-1018

Abstract: X-ray studies of the effect of high pressure on the crystalline structure of AgCl showed that the crystalline structure of the high-pressure phase of AgCl II is most likely a distorted version of a rhombic structure of the HgO type. The diffraction picture obtained in the experiment shows that the rhombic structure is closer to the experiment than the B9 structure. There was not a complete analogy in this case, however: the diffraction pictures differ in that strong reflections on HgO (210), (201), and (221) were either very weak or entirely unobserved in AgCl II pictures; analysis of interatomic distances shows that the position of atoms in both structures cannot be the same. The distances between neighboring atoms of Ag and Cl in AgCl II would be 2.25 Å in a chain and 2.7 and 3.4 Å in different chains. The corresponding values between atoms of Hg and O in HgO were equal to 2.03, 2.86, and 2.86 Å. With complete structural similarity one would expect one distance 2.3 Å and two different distances 3.1-3.3 Å in AgCl II. The authors note that it is still impossible to determine the true nature of the distortion, due to the limited amount of roentgenographic data.

Acc. Nr: AP0043584 Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1970, Vol 58, Nr 2, pp 486-493

INVESTIGATION OF THE CRYSTAL STRUCTURE OF THE ANTIMONY AND BISMUTH HIGH PRESSURE PHASES

S. S. Kabalkina, T. N. Kolobyanina, L. F. Vereshchagin

On basis of the similarity of the behaviour of $A^{IV}B^{VI}$ compounds and that of elements of the V^{th} group at high and normal pressures it is suggested that the SbIII and BiIII high pressure states crystallize in a monoclinally distorted SnS structural type. For p equal to 130—160 kbars the SbIII unit cell parameters are $a = 5.56$ A, $b = 4.04$ A, $c = 4.22$ A, $\beta = 86°$, $Z = 4$, $V = 93.8$ A^3. For $p = 35.5$ kbars the parameters of the BiIII monoclinal cell are $a = 6.65$ A, $b = 4.20$ A, $c = 4.65$ A, $Z = 4$, $\beta = 85°20'$, $V = 117.8$ A^3. Two symetrically independent Sb_1 and Sb_2 atoms are in the m plane of the $C^2_{2h} - P2_1/m$ space group. The SbIII (BiIII) structure is assumed to be lamellar. The layers consist of two covalent — bound, slightly goffered, planes. The interatomic distances correspond to a coordinate number of seven.

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18 DI

REEL/FRAME
19762056

1/2 023 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--HIGH PRESSURE SCALE -U-

AUTHOR-(04)-VERESHCHANGIN, L.F., SEMERCHAN, A.A., KUZIN, N.N., SADKOV, YU.A.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(3), 557-60

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--HIGH PRESSURE EFFECT, BISMUTH ALLOY, LEAD ALLOY, IRON ALLOY, COBALT CONTAINING ALLOY, ELECTRIC RESISTANCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/0565 STEP NO--UR/0020/70/191/003/0557/0560

CIRC ACCESSION NO--AT0126312

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--20NOV70

2/2 023

CIRC ACCESSION NO--AT0126312

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DEPENDENCE OF THE ELEC. RESISTANCE ON PRESSURE, P, OF BI AND PB, BI AND FE PLUS 5PERCENT CO, AND PB AND FE PLUS 5PERCENT CO WAS DETD. P FOR THE TRANSITION OF FE PLUS 5PERCENT CO ON THE 1968 SCALE WAS 145 PLUS OR MINUS 5, ON THE SCALE OF LOREE, ET AL. (1966) IT WAS 140, WHEREAS ON THE BUNDY SCALE (1967) IT WAS 165 KILOBARS.

UNCLASSIFIED

1/2 029 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--DEFORMATION AGING OF MARTENSITE BY USING HYDROEXTRUSION -U-

AUTHOR-(05)-KURDYUMOV, G.V., VERESHCHAGIN, L.F., ENTIN, R.I., GUREVICH, YA.B., KONYAYEV, YU.S.

COUNTRY OF INFO--USSR

SOURCE--FIZ. METAL METALLOVED. 1970, 29(4), 869-73

DATE PUBLISHED--------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATERIALS

TOPIC TAGS--METAL AGING, METAL DEFORMATION, METALLURGIC RESEARCH FACILITY, HYDROSTATIC EXTRUSION, MARTENSITE, ALLOY DESIGNATION, LOW ALLOY STEEL/(U)KHNMS LOW ALLOY STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/0369 STEP NO--UR/0126/70/029/004/0869/0873

CIRC ACCESSION NO--AP0126124

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--20NOV70

2/2 029

CIRC ACCESSION NO--AP0126124

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INVESTIGATIONS WERE PERFORMED ON STEEL OF THE KHNMS TYPE WITH A C CONTENT OF 0.45PERCENT, PREPD. BY OPEN INDUCTION SMELTING. WITH INCREASING DEGREE OF DEFORMATION THE STRENGTH AND THE YIELD POINT INCREASE. A "CRIT. DEGREE" OF DEFORMATION OF SIMILAR TO 5PERCENT IS OBSD. THEREBY, ABOVE WHICH THE INCREASE IN THE STRENGTH IS RELATIVELY SMALL. THE HIGHEST STRENGTH VALUES ARE OBTAINED UNDER THE CONDITIONS OF HYDROEXTRUSION OF MARTENSITE AND THE SUBSEQUENT NATURAL AGING AT ROOM TEMP. AS THE AGING TEMP. IS INCREASED, THE STRENGTH DECREASES, BUT THE EFFECT IS RETAINED EVEN AFTER AGING AT 400DEGREES. X RAY DIFFRACTION INVESTIGATIONS AND PRECISION D. MEASUREMENTS WERE EMPLOYED TO STUDY THE REASONS FOR THE SIMULTANEOUS INCREASE IN THE STRENGTH AND THE PLASTICITY OF THE STEEL. THE PREVIOUSLY OBTAINED RESULTS CONCERNING THE EFFECTIVENESS OF DEFORMATION AGING OF MARTENSITE UNDER HYDROEXTRUSION CONDITIONS WERE CONFIRMED. THE OPTIMUM TREATMENT CONDITIONS WERE ESTABLISHED. FACILITY: TSNIICHM IM. BARDINA, MOSCOW, USSR.

UNCLASSIFIED

1/2 034 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--SYNTHESIS OF POLYCRYSTALLINE FORMATIONS OF CUBIC BORON NITRIDE -U-

AUTHOR-(05)-VERESHCHAGIN, L.F., YAKOVLEV, YE.N., SLESAREV, V.N., VORFOLOMEYEVA, T.D., GLADKAYA, I.S.
COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(2), 345-6

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--BORON NITRIDE, CRYSTALLOGRAPHY, CHEMICAL SYNTHESIS, HIGH PRESSURE R AND D

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/1049 STEP NO--UR/0020/70/191/002/0345/0346

CIRC ACCESSION NO--AT0119916

UNCLASSIFIED

2/2 034 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AT0119916

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SYNTHESIS OF STRONG POLYCRYST. FORMATIONS OF THE CUBIC BN AND OF POLYCRYSTALS OF A GIVEN SHAPE IS REPORTED.

UNCLASSIFIED

USSR

UDC 536.424

VERESHCHAGIN, L. F., Academician, SHTERENBERG, L. YE., SLESAREV, V. N., Institute of High-Pressure Physics of the Academy of Sciences USSR, Post Office: Akademgorodok of the Podol'sk Region of Moscow Oblast

"On the Role of the Carbide Fe_3C in Diamond Synthesis"

Moscow, Doklady Akademii Nauk SSSR, Vol 192, No 4, 1 June 1970, pp 768-770

Abstract: The various ideas as to the role of carbides in diamond synthesis using such metals as Ta, Fe, Ni, Co and Mn as catalyst-solvents is discussed. The Fe-C system proposed by Giardini and Tydings is said to be doubtful, since theoretical and experimental studies have shown that Fe_3C cementite enters a stable phase under pressure. Since the solubility of cementite and diamond in the region of diamond synthesis is less than the solubility of graphite, diamond and cementite will be separated from a carbon solution in molten iron because the formation of Fe_3C must accompany the synthesis of diamond. The studies described here support this hypothesis. It was shown that a carbide of Fe_3C is formed in the stability region of diamond.

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USSR

VERESHCHAGIN, L. F., et al, Doklady Akademii Nauk SSSR, Vol 192, No 4, 1 June 1970, pp 768-770

Obtaining Fe_3C in the region of diamond growth indicates that its formation is a reaction accompanying diamond synthesis. To obtain diamonds in an iron-graphite system it is not sufficient that the pressure and temperature of the reaction correspond to the region of diamond synthesis; it is necessary that the amount of graphite exceed 25 at. % (relative to iron), corresponding to the stoichiometric composition of cementite. If the amount of graphite is equal to 25 at. %, only cementite is formed in the region of diamond growth. Since cementite enters a stable phase under high pressure, the region of diamond synthesis in the Fe-C system is limited to the left of the melting line of the iron-cementite eutectic under pressure (and not iron-graphite).

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USSR UDC 621.771

VERESHCHAGIN, L. F., GUREVICH, YA. B., DMITRIYEV, V. N., KONYAYEV, YU. S., and POLYAKOV, YE. V., Moscow

"High-Temperature Gas Extrusion of Metals"

Moscow, Fizika i Khimiya Obrabrabotki Materialov, No 4, Jul/Aug 72, pp 85-91

Abstract: An apparatus is described for extruding various materials at gas pressures to 10 kbars in the temperature range 20°-1000°C. The process of heating the blank under high gas pressures by passing a current through the blank was examined. Heating the preparations was shown to be feasible, with rates to 70°/sec, during which the deviation from a linear increase was not more than ±25°C. The amount of the initial heating of the gas was determined during its compression to 7 kbars in the apparatus. The processing of structural steels is feasible with the apparatus described.

USSR

UDC 537.312.62

VERESHCHAGIN, L. F., Academician; KONYAYEV, YU. S., BERZON, E. M., and VELLER, M. V., Institute of High-Pressure Physics, Academy of Sciences USSR, Akademgorodok, Podol'skiy Rayon, Moskovskaya Oblast

"Variation in the Superconducting Transition Temperature of Strained Niobium Stannide"

Moscow, Doklady Akademii Nauk SSSR, Vol 203, No 6, 1972, pp 1270-1271

Abstract: The authors subjected rods 1.5-3 mm in diameter made of Nb-Sn alloy (64 wt. percent Nb), containing Nb_3Sn as the principal phase, to plastic strain and studied the dependence of the superconducting transition temperature T_c on the amount of strain. The strain was applied on a two-stage hydroextrusion device in the 30-60 kbar extrusion pressure range with a counterpressure of 15-20 kbar. The strains reached $\varepsilon = 65$ percent. T_c was determined by the inductive method. It was found that there is already a sharp decrease in T_c at light reductions ($\varepsilon = 20$-30 percent) with a significant expansion of the transition range. An analysis of X-ray photographs taken

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USSR

VERESHCHAGIN, L. F., et al., Doklady Akademii Nauk SSSR, Vol 203, No 6, 1972, pp 1270-1271

by the powder method showed that with increased strain there is broadening of the interference lines and a decrease in their intensity.

To find how T_c is affected by stresses occurring during strain, a number of anneals of varying duration were carried out at 300-900° C. It was found that the anneals significantly increase the superconducting transition temperature. There is a 3-5 percent increase in the T_c of strained specimens after annealing at 900°. Annealing of the initial specimens does not cause any sharp change in T_c. The appearance of the X-ray photographs of all specimens annealed at temperatures up to 700° C does not change; beginning with 900° there is a decrease in the width and an intensification of the Nb_3Sn line intensity, indicating internal stress relief and possibly an increase in the tin content of the compound.

The authors thank Ye. S. Itskevich and V. A. Vlasov for affording the opportunity to perform the T_c measurements.

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Acc. Nr: AP0038559

Abstracting Service: CHEMICAL ABST. 4/70

Ref. Code: UR0366

78800s Interaction of diacetylenic ketones with amines. Vereshchagin, L. I.; Bol'shedvorskaya, R. L.; Okhapkina, L. L. (Inst. Neftekhim. Uglekhim. Sin., Irkutsk, USSR). *Zh. Org. Khim.* 1970, 6(1), 32–6 (Russ). The reaction of RCOC:CCPh (I) (R is Ph or 2-furyl) with secondary amines ($HNEt_2$, piperidine, or morpholine) gave, instead of the expected amino addn. products, 2-(R-substituted)-6-phenyl-4-pyrones (II) and smaller amts. $RCOCH_2COCH:CXPh$ (III) (X is NEt_2, morpholino, or piperidino). The hydrolysis of III (R = Ph, X = NEt_2) with dil. H_2SO_4 gave II (R = Ph). The reaction of I with $PhNH_2$ gave 2,6-diphenyl-4-phenyliminopyran (IV). Condensation of $BzC:CCH_2Bz$ with $PhNH_2$ gave IV. Analogously, 1-phenyl-6-(2-furyl)-4-phenyliminopyran was prepd. CPJR

ALS

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REEL/FRAME 19731737

7

1/2 009 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--CARBONYL COMPOUNDS AND THEIR ROLE IN THE AROMA OF FRUITS AND BERRIES -U-

AUTHOR-(04)-PISARNITSKIY, A.F., VERESHCHAGIN, P.V., MACHAROSHVILI, G.I., BOGATOVE, YE.G.

COUNTRY OF INFO--USSR

SOURCE--PRIKL. BIOKHIM. MIKROBIOL. 1970, 6(1), 13-17

DATE PUBLISHED--------70

SUBJECT AREAS--AGRICULTURE, BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--AGRICULTURE CROP, CHEMICAL ANALYSIS, CARBONYL COMPOUND, PAPER CHROMATOGRAPHY, ALDEHYDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0411/70/006/001/0013/0017

PROXY REEL/FRAME--1984/0895

CIRC ACCESSION NO--AP0055593

UNCLASSIFIED

2/2' 009 UNCLASSIFIED

CIRC ACCESSION NO--AP0055593 PROCESSING DATE--18SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COMPN. OF VOLATILE CARBONYL COMPDS. IN RASPBERRIES AND STRAWBERRIES AT DIFFERENT RIPENING STAGES, AND THEIR CONTENT IN MATURE FRUITS WERE DETD. THEY WERE SEPD. AS 2,4-DINITROPHENYLHYDRAZONES BY PAPER CHROMATOG. THE MAIN CHANGES NOTICED DURING THE MATURIZATION PROCESS WERE THE SYNTHESIS OF PHCHO AND THE DISAPPEARANCE OF HEXANAL AND HEXENE-2-AL.

UNCLASSIFIED

USSR UDC: 537.312.62

VERESHCHAGIN, V. G., KARASIK, V. R., KURGANOV, G. B.

"Method of Measurements of Longitudinal Critical Currents in Superconductive Alloys"

Moscow, Sverkhprovodyashchiye splavy i soyedin.--sbornik (Superconductive Alloys and Compounds--collection of works), "Nauka", 1972, pp 175-177 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12D551 [résumé])

Translation: In studying the dependence of critical currents on longitudinal magnetic field strength, procedural difficulties arise due to three circumstances: the necessity of locating the contacts in a strong magnetic field; the high current density (about 10^6 A/cm^2); the damaging effect of the transverse component of the magnetic field. These difficulties were overcome by means of a specially designed holder and by using ultrasonic tinning. Contacts are produced with a resistance of $\approx 10^{-8}$ Ω in a magnetic field of ~50,000 Bi/cm. The proposed method is used for measurements of longitudinal currents in superconductive specimens. One illustration, bibliography of five titles.

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VERESHCHAGIN, V.G.

Infrared Radiation

JPRS 56916

30 August 1972

TABLE OF CONTENTS AND FOREWORD OF A BOOK ON INFRARED FILTERS

[Excerpts from a Russian-language book by V. G. Vereshchagin and M. A. Validov; Minsk, Infrakrasnyye Fil'try, Russian, 1971, pp 3-4, 230-231]

Foreword

Infrared radiation is being used on a growing scale in scientific research and in practical applications. A number of monographs are devoted to this field of science and technology and its individual sections. There has been a particular increase in their number over the past two decades. Simplified methods of monochromatization of infrared radiation with the use of filters, however, has still not been systematically examined. At the same time significant success was attained in the last 10-15 years in the development and application of infrared filters. Infrared filters are used in quantum electronics, in astrophysical research, in pyrometry, in military science, as well as in chemistry, biology, and medicine. Without filters it is impossible to create a single infrared monochromator or spectrometer. High-speed methods of spectral molecular analysis are being developed on the basis of filters.

This monograph makes the first attempt to examine principles involved in the operation of various types of infrared filters, along with their spectral characteristics, and certain structural peculiarities.

The first chapter in the monograph is an introduction. It contains a brief description of the spectral characteristics of sources and receivers of infrared radiation without a consideration of which it is impossible to make a correct determination of the demands made on filters utilized in various areas of the infrared spectrum. The second paragraph of the chapter contains general information about constant optical materials which are needed for an understanding of the interaction of infrared

USSR

UDC 546.821.882.620.187

VOZILKIN, V. A., BUYNOV, N. N., BYCHKOV, Yu. F., VERESHCHAGIN, V. G., KARASIK, V. R., KURGANOV, G. B., and MAL'TSEV, V. A., Institute of Metal Physics, Academy of Sciences USSR; Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Electron-Microscopic Investigation of the Structure of Superconducting Alloy Ti-22 at. % Nb"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 30, No 4, Oct 70, pp 753-761

Abstract: A study was made of the structure of a superconducting alloy (Ti--22 at. % Nb) with the help of a transmission electron microscope. The heat treatment regimes were determined at which separation of ω- and α- phases takes place in the alloy. The formation of the separations of ω-phase, whose dimensions increase with an increase in the aging temperature, was observed in the alloy during water quenching from 800°. In the 390-425° interval of aging temperatures while in the 470-500° interval, particles of the ω-phase were separated in the quenched alloy the separations were predominantly particles of the α-phase. A study was made of the shape and orientation

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USSR

VOZILKIN, V. A., et al, Fizika Metallov i Metallovedeniye, Vol 30, No 4, Oct 70, pp 753-761

of the particles of these phases. The effect of dimensions of the particles of ω- and α-phases on the dependence $j_c(H)$ is shown. The authors thank T. V. SHCHEGOLEVA and V. G. RAKIN for useful discussion and S. A. KHUDOTEPLOV for assistance in obtaining the electron-microscopic photographs.

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UDC 535.34

USSR

BORISEVICH, N. A., and VERESHCHAGIN, V. G.

"New Dispersion Filter for the Infrared Region of the Spectrum"

Minsk, Zhurnal Prikladnoy Spektroskopii, Vol. 12, No. 1, Jan 1970, pp 168-172

Abstract: This paper describes a new crystal-crystal type of filter which is superior to the crystal-air and crystal-fluid dispersion filters described in earlier literature. The defects of these two latter types, which the new type avoids, is that they change their characteristics under vibration. In the crystal-fluid filter, furthermore, the container may lose its hermetic sealing. In the manufacture of crystal-air or crystal-fluid filters, two highly polished crystal plates, transparent for the infrared region of the spectrum, must be used; for the new type of crystal-crystal filter, there is no need for polished plates. Hence, losses in infrared radiation are reduced and so is the cost. A table of various types of crystal-crystal filters and their basic characteristics is given. Curves are also given showing the bandwidths of the different crystal types listed in

USSR

BORISEVICH, N. A., et al, Zhurnal Prikladnoy Spektroskopii, Vol. 12, No. 1, Jan 1970, pp 168-172

the table. The authors have also developed a new method for the preparation of these filters and describe their method of growing the crystals used. Another claim made for the new crystal-crystal filter is that its transmissibility is practically independent of the temperature. Moreover, it is stable and mechanically sturdy.

USSR

UDC: 533.9

VERESHCHAGIN, V. L.

"Effect of the Parameters of an Electric Circuit on the Distribution of Energy in a Plasma Jet"

Samoletostr. i tekhn. vozd. flota. Resp. mezhved. temat. nauch.-tekhn. sb. (Airplane Building and Air Line Technology. Republic and Interdepartmental Thematic Scientific-Technical Collection of Works), 1971, No 26, pp 8-10 (from RZh-34. Aviatsionnyye i Raketnyye Dvigateli, Moscow, No 3, 1972, Abstract No 3.34.134)

Translation: An experimental evaluation is made of the effect of the parameters of a discharge circuit (of the capacitor capacitance, its energy and initial circuit inductance) on energy distribution in a plasma jet produced by a conical, erosional source. It is shown that under the conditions of the given experiment, variation in circuit parameters does not affect the efficiency of energy transmission from the storage circuit to the plasma. The only effect is the redistribution of the total energy of the plasma among its individual components. Original article: three illustrations and eight bibliographic entries. Resume.

1/1

1/2 030 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--STUDY OF HEAT FLUXES IN A PULSED PLASMA ACCELERATOR -U-

AUTHOR-(04)-RUSANOV, V.P., SAFRONOV, B.G., VERESHCHAGIN, V.L., POPOV, N.P.

COUNTRY OF INFO--USSR

SOURCE--INZH. FIZ. ZH.; 18: 534-7 (MAR 1970)

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SUBJECT AREAS--PHYSICS

TOPIC TAGS--PLASMA ACCELERATOR, PLASMA JET, ELECTRODE PROPERTY, ENERGY SPECTRUM, TEMPERATURE MEASUREMENT, PLASMA MEASUREMENT

CONTROL MARKING--NO RESTRICTIONS

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2/2 030 UNCLASSIFIED PROCESSING DATE--13NOV70

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DURING THE PULSED OPERATION OF AN EROSION TYPE PLASMA ACCELERATOR, THE THERMAL STATE OF STRUCTURE ELEMENTS IS DETERMINED AND THE PARAMETERS OF THE PLASMA JET ARE MEASURED. THE INNER ELECTRODE IS SHOWN TO HAVE THE HIGHEST TEMPERATURE. WITHIN THE OPERATION OF THE ACCELERATOR, AN INTENSIVE RISE IN DIELECTRIC TEMPERATURE TAKES PLACE RESULTING IN CHANGES IN THE PLASMA JET PARAMETERS. ESTIMATION OF THE ENERGY DISTRIBUTION IN A DISCHARGE WAS CARRIED OUT FROM THE MEASUREMENT RESULTS.

UNCLASSIFIED

1/2 013 UNCLASSIFIED

TITLE--HIGHLY LOCAL X RAY MICROANALYZER -U- PROCESSING DATE--30OCT70

AUTHOR-(05)-VASICHEV, V.N., VERESHCHAGIN, YE.N., DERSHVARTS, G.V., KAPLICHNYY, V.N., KISEL, G.D.

COUNTRY OF INFO--USSR

SOURCE--PRIB. TEKH. EKSP. 1970, 1, 217-20

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SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTRON MICROSCOPE, X RAY SPECTROMETER, MICROCHEMICAL ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1476 STEP NO--UR/0120/70/001/000/0217/0220

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UNCLASSIFIED

2/2 013 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0106232

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN ELECTRON MICROSCOPE X RAY MICROANALYZER IS DESCRIBED WHICH MAKES IT POSSIBLE TO CONDUCT AN X RAY SPECTRUM ANAL. OF AREAS WITH A DIAM. SIMILAR TO OR LESS THAN 500 ANGSTROM. RESULTS OF TESTING OF THE LIGHTING SCHEME OF THE DEVICE AND ITS NONDISPERSION SYSTEM OF REGISTRATION OF CHARACTERISTIC SPECTRA ARE PUBLISHED. LINES OF THE CHARACTERISTIC SPECTRUM CAN BE REGISTERED IF THE WT. OF THE PART OF THE MATERIAL UNDER STUDY EQUALS 1.7 TIMES 10 PRIME NEGATIVE17 G.

UNCLASSIFIED

1/2 010 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--KINETICS OF THE REDUCTION OF IRON OXIDES BY THE COMBINATION OF GASES AND SOLID CARBON -U-

AUTHOR-(02)-VERESHCHAGIN, YU.F., MOKSHANTSEV, G.F.

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., CHERN. MET. 1970, 13(2), 16-19

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--IRON OXIDE, METAL REDUCTION, CARBON BLACK, CARBON MONOXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1407 STEP NO--UR/0148/70/013/002/0016/0019

CIRC ACCESSION NO--AT0120200

UNCLASSIFIED

2/2 010 UNCLASSIFIED

CIRC ACCESSION NO--AT0120200 PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PURPOSE OF THE WORK WAS TO OBTAIN EXPRESSIONS FOR THE RATE OF THE PROCESS AND THE TIME OF ATTAINING A GIVEN DEGREE OF REDN., ON THE BASIS OF THE KNOWN PREREQUISITES RELATIVE TO THE STAGEWISE MECHANISM OF THE GASIFICATION PROCESS AND RELATIVE TO THE PROPOSITIONS ASSUMED BY S. T. ROSTOVTSEV (1952). IT WAS ALSO ASSUMED THAT THE LAYER TO BE REDUCED CONSISTS OF ONE LOWER OXIDE, WHICH IS UNIFORMLY MIXED WITH SOLID C (SOOT); THAT THE CALCN. MODEL IS AN INFINITE LAYER OF THICKNESS ALPHA, AND THAT THE REDUCING ATM. IS PURE CO. FROM THESE CONSIDERATIONS, FORMULAS WERE DEDUCED TO DESCRIBE THE KINETIC DEPENDENCES RELATIVE TO THE COMBINATION REDN. PROCESS. FACILITY: ORENBURG. FILIAL KUIBVSHEV. POLITEKH. INST., ORENGURG, USSR.

UNCLASSIFIED

USSR

UDC 546.791'621'175-145.03

VASHMAN, A. A., VERESHCHAGINA, T. Ya., and PRONIN, I. S.

"Nuclear Magnetic Relaxation of ^{31}P and Ligand Exchange in Organophosphorus Compound Solutions of Uranyl Nitrate"

Moscow, Zhurnal Neorganicheskoy Khimii, Vol 17, No 2, Feb 72, pp 471-476

Abstract: By applying the spin echo method, the temperature relations of the time of nuclear magnetic spin-spin relaxation of ^{31}P were determined for solutions of uranyl nitrate in tributyl phosphate (I), tributyl phosphinate [sic] (II), and tributylphosphine oxide (III). On the basis of the data obtained, the lifetime of ligands in the solvate shells of the complexes that formed, the solvate shifts, and the parameters of activation in the solutions were calculated. With decreasing electronegativity of substituents at P in the order I, II, III in the organophosphorus compounds, the entropy of activation of the complex formed with uranyl increased from -28.2 to -23.8 cal/mole. degree, the activation energy of molecular motion in the solvent increased from 5.8 to 7.0 kcal/mole, and the extraction capacity of the latter rose. H_2O and HNO_3 affected the stability of the uranyl organophosphorus complex by reacting with the organophosphorus ligands in exchange reactions.

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USSR

UDC[537.226+537.311.33]:538

VERESHCHAK, M. F., ZHETBAYEV, A. K., and KAIPOV, D. K.

"Temperature Dependence of Mössbauer Spectrum Parameters of Natural Magnetite"

Temperaturnaya zavisimost' parametrov messbauerovskogo spektra prirodnogo magnetita (cf. English above), Institute of Nuclear Physics, Academy of Sciences Kazakh SSR, Alma-Ata, 1971, 10 pp, ill., bibliography with three titles, No 3460-71 Dep (from RZh-Fizika, No 2, Feb 72, Abstract No 2YE1430 DEP from authors' abstract)

Translation: Hyperfine structure parameters of the Mössbauer spectrum of natural magnetite Fe_3O_4 are studied in the wide temperature range of 80-900°K. The temperature dependence of values of the internal magnetic fields on two sublattices is determined; the Curie temperature is found to be equal to (885±9)°K. It is found that the isomeric shift of the spectrum of sublattice A (tetrahedral) increases by 0.15 mm/sec in the 450-650° K temperature range. Below 113° K the spectrum changes, due to localization of electrons in the tetrahedral sites of the Fe sublattice.

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USSR

UDC 621.315.592

TSARENKOV, B. V., AKPEROV, YA. G., VERESHCHAK, N. I., YEVSTROPOV, V. V., IMENKOV, A. N., YAKOVLEV, YU. P. Physicotechnical Institute imeni A. F. Ioffe of the USSR Academy of Sciences, Leningrad

"Diode Sources of Red Light made of Variband $Ga_{1-x}Al_xAs$:Si p-n- structures"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 6, No 5, 1972, pp 921-925

Abstract: The results of the development and study of the properties of semiconductor sources of red light based on variband $Ga_{1-x}Al_xAs$ p-n-structures alloyed with Si are discussed. These p-n-structures were created by epitaxial growth of a solid solution of $Ga_{1-x}Al_xAs$:Si from a liquid Ga-Al-As-Si solution on an n-Ga-As substrate with cooling; the composition of the $Ga_{1-x}Al_xAs$ epitaxial layer was smoothly varied in the direction of growth so that the width of the forbidden zone decreased from the boundary with the substrate with a gradient of $(2-3)\cdot10^{-3}$ ev/micron. The thickness of the p-region in the light diodes was 20-31 microns, and the n-region was 60-70 microns. Radiation was generated perpendicular to the plane of the p-n-junction or through the p-layer or through the n-layer of the p-n-structure.

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USSR

UDC 621.315.592

TSARENKOV, B. V., et al., Fizika i Tekhnika Poluprovodnikov, Vol 6, No 5, 1972, pp 921-925

The electric and electroluminescent characteristics of the $Ga_{1-x}Al_xAs$ p-n-structures with an area of 0.5 mm^2 at room temperature are as follows: 1) the forward current increases exponentially with an increase in voltage ($I \sim \exp(qV/\beta kT)$ where $\beta = 1.4-1.6$) to voltages of 1.5-1.6 volts, and then it increases linearly (current cutoff voltage 2.0-2.1 volts); 2) the radiation spectrum consists in only one band with a peak energy of 1.72-1.76 electron volts which does not shift with current variation; 3) with an increase in current the radiation power first increases superlinearly (to 2 amps/cm^2) and then linearly (to 100 amps/cm^2); 4) the external quantum yield of the radiation is 0.5-0.6 percent for 20 milliamps and 0.6-0.8 percent for 200 milliamps; 5) the characteristic times of the transient electroluminescent processes decrease with an increase in current; they are 200 nanoseconds for small currents and 100 nanoseconds for large currents.

These light sources do not become degraded for at least 1,000 hours of operation with a forward current of 20 milliamps and an ambient temperature of +70°C.

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Precision Mechanical and Optical

USSR

UDC: 528.519:621.376

Adrianova, I. I., Candidate of Technical Sciences, Asnis, L. N., Vereshchaka, A. I., Nesterova, Z. V., Candidate of Technical Sciences, and Popov, Yu. V., Candidate of Technical Sciences

"Frequency Conversion with Dual Modulation of Light in Light Rangefinders"

Optiko-Mekhanicheskaya Promyshlennost', No 5, 1972, pp 8-11.

Abstract: Nonlinear distortions are studied with dual modulation by polarization, resulting from operating modes of light modulators. It is shown that with the maximum signal at the intermediate frequency, the nonlinear distortions amount to 27%. It is found to be possible to decrease nonlinear distortions by selecting the operating mode of the light modulator and converter. In contrast to the method of the phase detector, in the light modulator studied, the method of conversion of frequency in the modulator is free of errors related to changing position of the plane of polarization of radiation as it propagates from the modulator to the converter. Thus, when the converter is missmatched with the modulator by ±15°, equivalent to rotating the plane of polarization of the radiation by the same angle, the phase error does not exceed the error of the measuring device (±1°). The results produced can be used to select the operating mode

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USSR

Adrianova, I. I., Asnis, L. N., Vereshchaka, A. I., Nesterova, Z. V., and Popov, Yu. V., Optiko-Mekhanicheskaya Promyshlennost', No 5, 1972, pp 8-11.

of an optical radiation modulator and converter in a light rangefinder with frequency conversion and dual light modulation.

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USSR

UDC 535.241.13.535.511

ASNIS, L. N., and VERESHCHAKA, A. I.

"Experimental Investigation of Phase Characteristics of Galliun Arsenide Crystal Modulator"

Leningrad, Optiko-mekhanicheskaya promyshlennost' No 11, Nov 71, pp 13-14

Abstract: The modulation phase distribution across the beam, along and normal to a field applied to the modulator, was experimentally investigated. Three-path and five-path electrooptical gallium arsenide crystal (GaAs) modulators were studied. Bloc diagrams of the experimental setup and techniques are presented. A commerical OKG-15 laser of 10.6 mkm emission wave length and 1 w output power in single mode regime was used as emission source. Variations of the emission intensity up to a photo receiver five meters away, and of the modulation phase with the coordinate of the modulated beam cross section are presented in graphs. Their analysis shows, that insignificant phase errors in gallium arsenide crystal modulator made it possible to use it in accurate phase light-detection apparatus, that errors of the three- and five-path modulator are practically the same, and that modulation phase variation across the beam may be explained by the electrical field irregularity across the crystal, due to the inhomogeneity of the crystal.

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UDC [629.7.03:533.011].001.2

USSR

VERESHCHAKA, L. P., KRAYKO, A. N., STERNIN, L. Ye.

"Grid-Characteristic Method for Calculating Plane and Axisymmetric Supersonic Two-Phase Flows"

V sb. Lopatochn. mashiny i struyn. apparaty (Vane Machines and Jet Equipment -- Collection of Works), No. 6, Moscow, "Mashinostroyeniye", 1972, pp 163-178 (from RZh - 34. Aviatsionnyye i raketnyye dvigateli, No 9, Sep 72, Abstract No 9.34.104)

Translation: The problems of calculating plane and axisymmetric supersonic two-phase flows by the grid-characteristic method are discussed. Basically the two-liquid model was discussed, which replaces the actual flow with a mutually penetrating motion of two interacting continuous media: the actual gas and a "gas" of particles deprived of pressure. Methods for solving elementary problems and determining the parameters at characteristic points are described and a general method of calculating the flow in the channel is given. Sample calculations are presented for the flow of a gas mixture with particles of different natures in an axisymmetric nozzle using the proposed method. The results of a one-dimensional approximation and the results of

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USSR

VERESHCHAKA, L. P., et al, Lopatochn. mashiny i struyn. apparaty, No. 6, Moscow, "Mashinostroyeniye", 1972, pp 163-178

a calculation using the quasi-one-dimensional two-layer model are compared. The effectiveness of the grid-characteristic method and the ordinary method of characteristics is compared. 8 ill., 1 table, 12 ref. Resume.

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USSR

UDC 539.166:666.942

CHERKINSKIY, YU. S., KOROLEVA, A. T., and VERESHCHINSKIY, I. V., All-Union Scientific Research Institute of New Construction Materials and Physico-Chemical Institute imeni Karpov

"Effect of Ionizing Radiation on Cement"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 43, No 12, Dec 70, pp 2736-2739

Abstract: Exposure of Portland or Alumina cement to a 200 Mrad dose of γ - radiation has no effect on their crystal structure. Some changes are observed in the structure of these cements: aqueous suspension of irradiated Portland cement reaches its maximum creep strength somewhat faster than the non-irradiated material; the opposite is true for the alumina cement. There is no observable difference in mechanical strength or the degree of hydration between the irradiated and non-irradiated specimens. It has been proposed that the neogenic polymeric hydrates found in the cement rock are formed by polycondensation.